IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

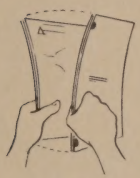
to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***

1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.



2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 495 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ AUGUST 1960

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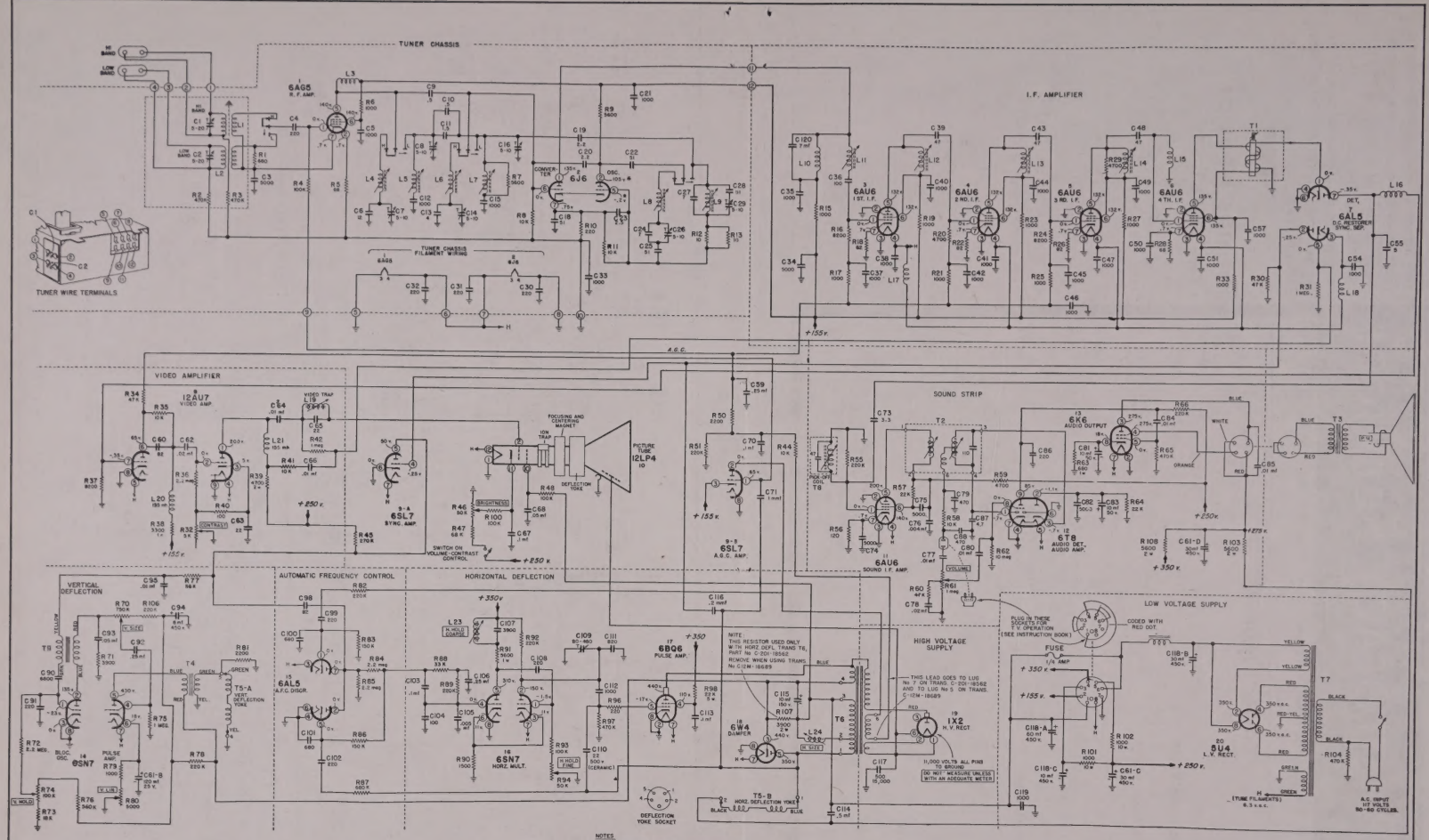
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

Coronado Model
94TV1-43-8940A

Sharp Model
TR-203



NOTES

VOLTAGE READINGS TAKEN WITH A 20,000 OHM PER VOLT VOLTMETER BETWEEN POINTS SHOWN AND CHASSIS

NORMAL OPERATION, NO SIGNAL INPUT.

LINE VOLTAGE 117 V.A.C.

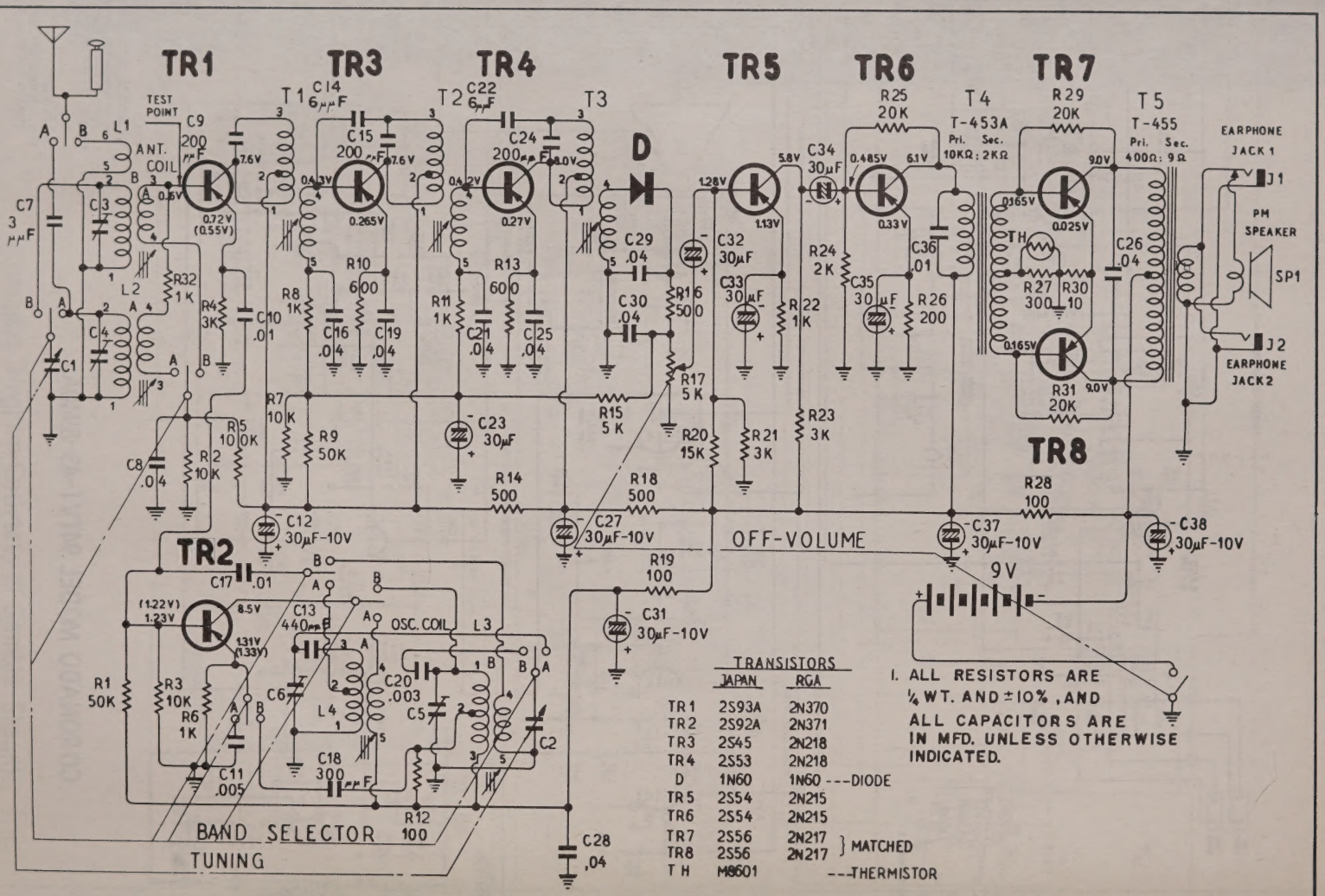
M MEASURED WITH 220 K OHM RESISTER IN SERIES WITH METER.

CAPACITOR VALUES SHOWN IN "MMFD" UNLESS OTHERWISE SHOWN.

THIS SCHEMATIC APPLYS TO CHASSIS STAMPED "CODE 15"

CORONADO MODEL 94TV1-43-8940A

Schematic Diagram Courtesy of Gamble-Skogmo, Inc.



TRANSISTORS	JAPAN	RCA	
TR1	2S93A	2N370	
TR2	2S92A	2N371	
TR3	2S45	2N218	
TR4	2S53	2N218	
D	1N60	1N60	---DIODE
TR5	2S54	2N215	
TR6	2S54	2N215	
TR7	2S56	2N217	} MATCHED
TR8	2S56	2N217	} MATCHED
TH	M8601		---THERMISTOR

1. ALL RESISTORS ARE ¼ WT. AND ±10%, AND ALL CAPACITORS ARE IN MFD. UNLESS OTHERWISE INDICATED.

SHARP MODEL TR-203

Schematic Diagram Courtesy of Montgomery Ward & Co.

PHOTOFACT® Folder with CIRCUITRACE®

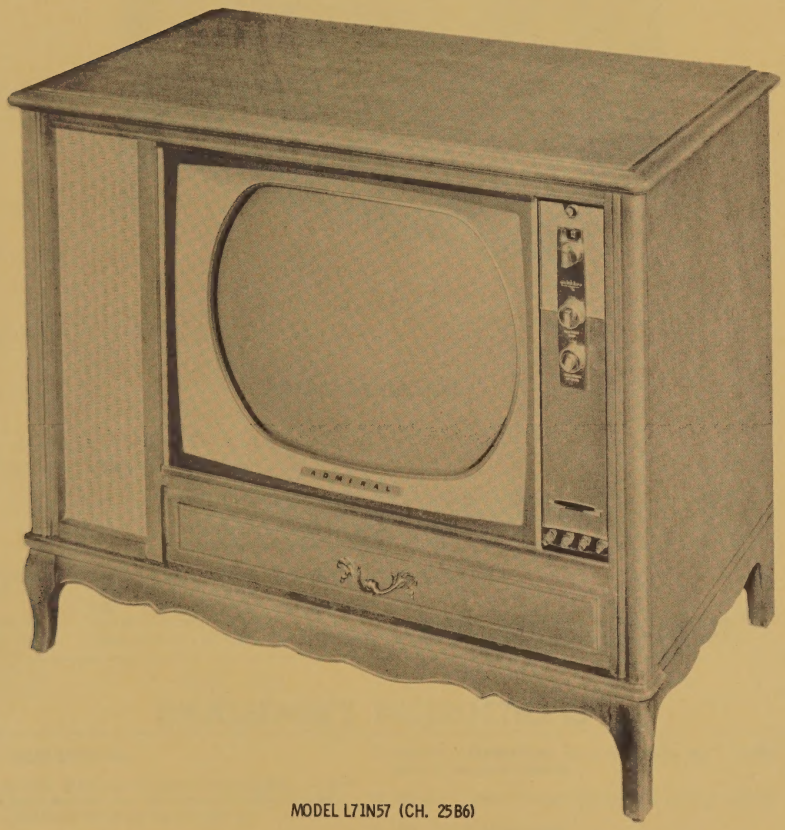
ADMIRAL CHASSIS 25A6, 25B6, 25UA6, 25UB6

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ADMIRAL CHASSIS 25A6, 25B6, 25UA6, 25UB6



MODEL L71N57 (CH. 25B6)

ADMIRAL CHASSIS 25A6, 25B6, 25UA6, 25UB6

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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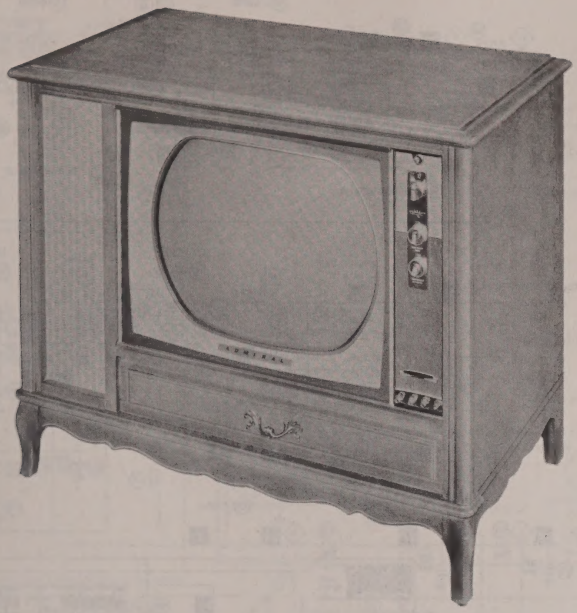
SET 495 FOLDER 1

PHOTOFACT® Folder with CIRCUITRACE®

ADMIRAL CHASSIS 25A6, 25B6, 25UA6, 25UB6

ADMIRAL CHASSIS 25A6, 25B6, 25UA6, 25UB6



MODEL L71N57 (CH. 25B6)

TRADE NAME	ADMIRAL	MODELS	CHASSIS
		C71N21, C71N22, C71N23, T71N10, T71N12, T71N13	25A6
		C71N31, C71N37, L71N41, L71N42, L71N43, L71N52, L71N57	25B6
		C71UN21, C71UN22, C71UN23, T71UN10, T71UN12, T71UN13	25UA6
		C71UN31, C71UN37, L71UN41, L71UN42, L71UN43, L71UN52, L71UN57	25UB6
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois		
TYPE SET	Color Television Receiver		
TUBES	VHF - Twenty Six, UHF - Twenty Seven		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING	290 Watts, 2.75 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

DISASSEMBLY INSTRUCTIONS

SAFETY GLASS REMOVAL

Remove molding at top and bottom of safety glass. Insert blade of a small screwdriver into the vertical slot in bracket at top. Slide bracket to the right to release.

CHASSIS REMOVAL MODEL L71N57

1. Remove 5 wood screws and 2 metal screws holding rear cover.
2. Remove rear cover.
3. Remove 6 push-on type knobs from front of cabinet.
4. Remove picture tube socket, yoke leads, speaker leads, high voltage lead and yoke plug.
5. Remove 2 chassis bolts at top of chassis, and 2 chassis bolts at bottom of cabinet.
6. Remove 3 metal screws holding lower control bracket.
7. Pull chassis straight out.

PICTURE TUBE REMOVAL

1. It is necessary to remove chassis for picture tube removal. (See "Chassis Removal".)
2. Remove 4 nuts holding picture tube mounting bracket.
3. Pull picture tube straight out.

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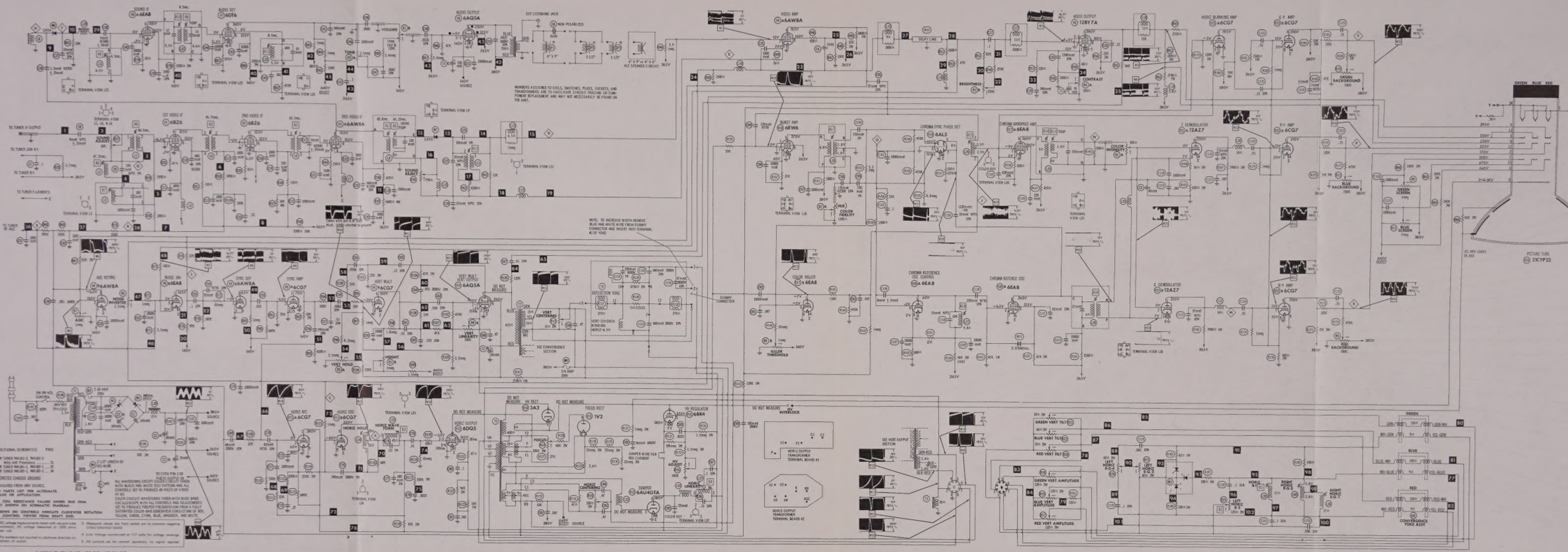
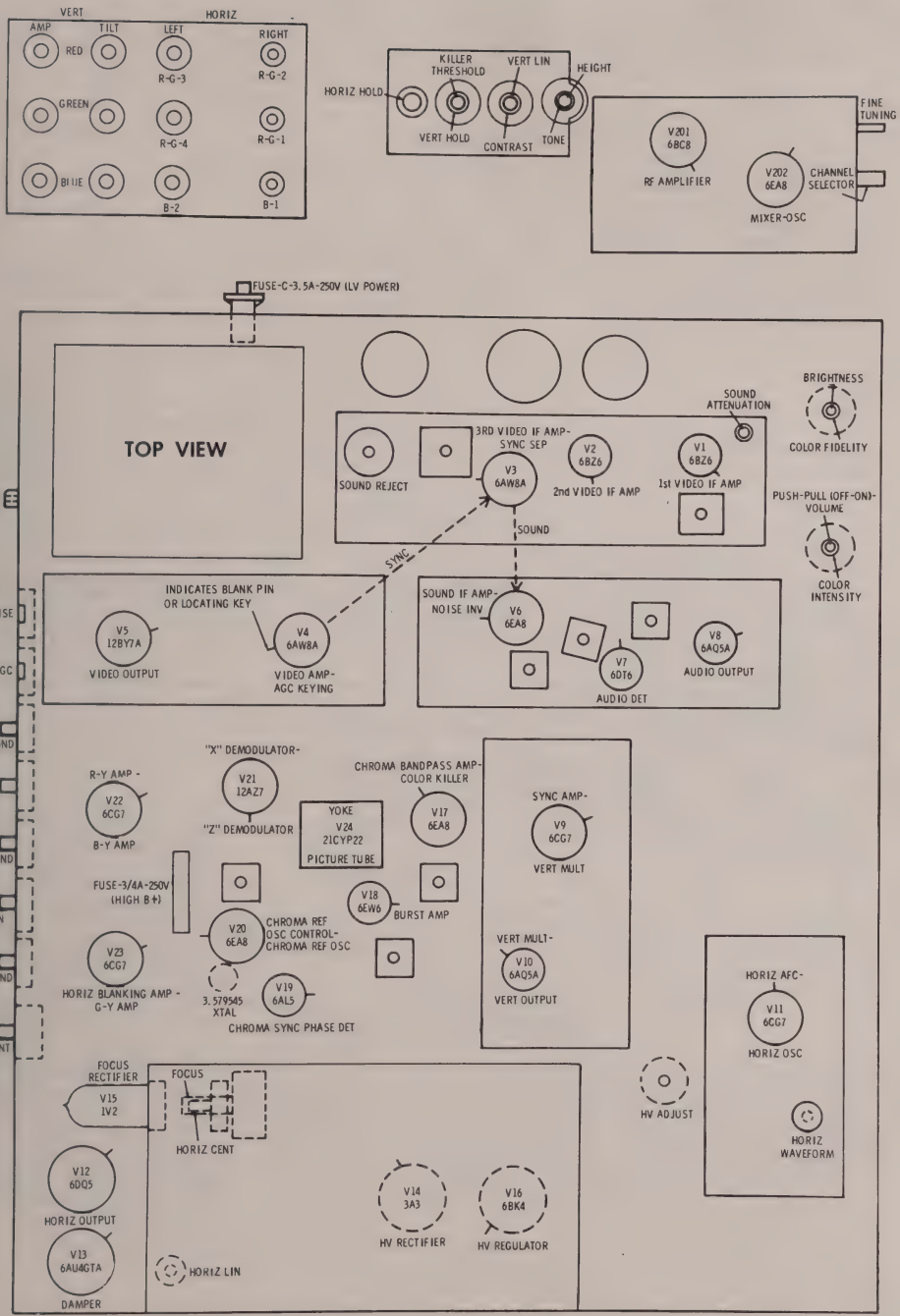
KB55

SET 495 FOLDER 1



ADMIRAL CHASSIS 25A6, 25B6, 25U6, 25UB6

TUBE PLACEMENT CHART



ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 6 volt bias supply to point Ⓐ. Positive to chassis.
Connect the negative lead of a 15 volt bias supply to point Ⓑ. Positive to chassis.
Connect the negative lead of a 7 volt bias supply to point Ⓒ. Positive to chassis.
Connect the negative lead of a 7 volt bias supply to pin 2 (grid) of the Horizontal Blanking Amp. Positive to chassis.
Connect a clip lead from point Ⓔ to chassis. Preset Sound Reject (R26) at 75% clockwise rotation. Preset Sound Adjust (R27) at 50% rotation.
Video IF shield must be in place during alignment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. (V202). Low side to chassis.	43.8MC (Unmod)	4	DC probe thru 10K to point Ⓓ. Common to chassis. Use negative scale.	A1	Adjust for maximum deflection. Use peak with core nearest printed board end of coil. Maintain VTVM reading of 1.5 volts by adjusting signal generator output.
2.	"	"	42.5MC	"	"	A2	"
3.	"	"	45.75MC	"	"	A3	"
4.	"	"	44.0MC	"	"	A4	"
5.	"	"	"	"	"	Mixer Plate Coil	Adjust for maximum deflection with peak at top end of coil.
6.	"	"	41.25MC	"	"	A5, R26	Adjust A5 and Sound Reject (R26) simultaneously for MINIMUM deflection with slug away from chassis. Reduce bias at point Ⓐ if necessary for sufficient indication.
7.	"	"	47.25MC	"	"	A6, R27	Adjust for MINIMUM deflection with slug away from chassis.
8.	"	"	41.25MC	"	DC probe thru 10K to point Ⓕ. Common to chassis.	A7	Increase bias at point Ⓐ to -6 volts. Adjust A7 for MINIMUM deflection with slug away from chassis.

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect a .001mfd capacitor in series with a 180Ω resistor from pin 5 (Plate) of the 2nd Video IF Amp. to chassis with the resistor next to chassis.
Connect a 1000mmf capacitor across the scope leads.
The Video IF shield must be in place during alignment.
Connect the DC probe of the VTVM to point Ⓑ. Common to chassis. (Use negative scale).
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. (V202). Low side to chassis.	45MC	42.17MC 45.75MC	4	Vert. Amp. thru demodulator probe (Fig. 1) to pin 5 (plate) of 1st Video IF. Low side to chassis.		Set sweep output for .1 volt peak to peak on scope. Retouch Mixer Plate Coil and A4 for maximum gain and symmetry of response similar to Fig. 2. Reduce the bias to -4 volts at point Ⓐ if necessary.
10.	"	"	"	41.25MC	"	"		Reduce bias at point Ⓐ to zero. Retouch A7 to place marker in trap notch as in Fig. 2.
11.	"	"	"	47.25MC	"	"		Retouch A6 and R27 to place marker in trap notch as in Fig. 2. Remove capacitor and resistor load from 2nd Video IF. Increase bias at point Ⓐ to -6 volts.
12.	"	"	"	41.65MC 42.17MC 42.75MC 45.0MC 45.75MC	"	Vert. Amp. thru 10K to point Ⓓ. Low side to chassis.		Use 3 volts peak to peak on the scope. Retouch A1, A2 and A3 for response similar to Fig. 3 with markers as shown. A1 controls the tilt. A2 affects 42.17MC side of curve and A3 affects the 45.75MC side. Connect a .001mfd capacitor from point Ⓖ to chassis.
13.	"	"	"	41.25MC	"	"		Retouch A5 and R26 to place marker in trap notch if necessary. Remove .001mfd.
14.	Fig. 4	Across VHF antenna terminals thru matching network (Fig. 4).	All VHF Channels separately	42.17MC	All VHF Channels separately	"		Decrease bias at point Ⓗ to -3 volts. SLIGHTLY retouch A1, A2 and A3 to correct for any overall tilt that is approximately the same on all channels. Repeat step 13.

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply to point (A). Positive to chassis.
In the following steps the signal level may be reduced by disconnecting the lead from the terminal at point (F) and connecting a 1meg potentiometer from point (F) to chassis. The lead is then connected to the center arm of the control. This arm is then used to control the level of the signal applied to the Sound IF strip. Start alignment with the control turned to maximum signal.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
15.	.001mfd	High side to point (H). Low side to chassis.	4.5MC (400∿ FM Mod. 15KC swp)	Any non-interfering channel	DC probe thru diode probe (Fig. 5) to pin 1 (grid) of Audio Det. Common to chassis.	A8	Connect a jumper from pin 7 (grid) of Audio Det. to chassis. Adjust for maximum deflection. Set generator for 1 volt on VTVM. Use peak with slug nearest top of coil form.
16.	"	"	"	"	"	A9, A10	Adjust for maximum deflection. Set generator for 1 volt on VTVM. Remove VTVM, diode probe and jumper.
17.	"	"	"	"	USE SCOPE Across voice coil	A11	Starting with slug fully counterclockwise, adjust to a peak. Continue turning clockwise until a second peak is reached and adjust for maximum at this second peak. Decrease signal until detector breaks out of lock as indicated by jagged portions of the sine wave on scope. Retouch A9 for symmetrical breakout similar to Fig. 6.

ALTERNATE SOUND IF ALIGNMENT USING FM GENERATOR

Connect the negative lead of a 10 volt bias supply to point (A). Positive to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
15.	.001mfd	High side to point (H). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode probe (Fig. 5) to pin 1 (grid) of the Audio Det. Common to chassis. Connect scope across speaker voice coil.	A8	Connect a jumper from pin 7 (grid 3) of Audio Det. to chassis. Adjust A8 for maximum deflection on VTVM. Use peak with slug nearest top of coil form.
16.	"	"	"	"	"	A9, A10	Adjust for maximum deflection. Set generator output for 1 volt on VTVM. Peak with maximum core separation. Repeat steps 15 and 16.
17.	Remove the diode probe and jumper. Turn off the signal generator and tune in the strongest signal in the area. Set Volume control for normal volume. Set All so that core is flush with the top of coil form. Observe scope and listen to sound. Change bias at point (A) to zero. Adjust All clockwise to peak. Continue clockwise to a louder peak, and adjust for maximum output at this second peak. Gradually decrease the signal until sound becomes distorted. Maintain distorted signal and adjust A9 for maximum output.						

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
18.	.001mfd	High side to point (H). Low side to chassis.	4.5MC (400∿ AM)	Any non-interfering channel	USE SCOPE Vert. Amp. thru demodulator probe to pin 6 (plate) of 1st Chroma Bandpass Amp. Low side to chassis.	A12	Adjust for MINIMUM 400∿ indication on scope.

CHROMA BANDPASS ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point (J). Positve to chassis.
Connect a clip lead from point (E) to chassis.
Turn Color control fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	.1mfd	High side to pin 2 (grid) of 1st Chroma Bandpass Amp. Low side to chassis.	3.58MC (3-5MC Swp)	3.08MC 4.08MC	Any non-interfering channel	Vert. Amp. thru demodulator probe (Fig. 7) to pin 7 (grid) of "X" Demodulator. Low side to chassis.	A13, A14	Adjust for response similar to Fig. 8 with equal marker height.
20.	Turn Brightness, Contrast and Noise controls fully counterclockwise. Connect a 330Ω resistor and 4mfd capacitor in series from plate. Pin 6 of 1st Chroma Bandpass Amp. to chassis.							
21.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. (202). Low side to chassis. Connect high side of a separate marker generator to an ungrounded tube shield floating over 1st Chroma Bandpass Amp. Low side to chassis.	4.5MC (10MC Swp)	3.08MC 4.08MC	Any non-interfering channel	Vert. Amp. thru demodulator probe (Fig. 7 to pin 7 (grid) of "X" Demodulator. Low side to chassis.	A15	Remove clip lead between point (E) and chassis. Adjust for response similar to Fig. 9. Peak with core nearest chassis end of coil form.

MISCELLANEOUS ADJUSTMENTS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
B3, B4....GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

Connect a 0-500MA meter in series with the cathode circuit of the Horizontal Output tube. Connect a .47mfd capacitor across the meter terminals. Connect a 0-1MA meter in series with the cathode circuit of the HV Regulator by removing the test jumper and connecting the meter in its place. Connect the high side of the scope thru a low capacity probe to point (K). Low side to chassis. Connect the DC probe of the VTVM thru a high voltage probe to the High Voltage Rectifier "cup". Common to chassis.
Set the Focus control fully counterclockwise. Set the High Voltage Adjust at two-thirds clockwise rotation. Tune the receiver to a station signal and synchronize the picture. Adjust the Horizontal Waveform slug (B3) for waveform similar to Fig.11 with the round and sharp peaks at equal amplitudes. Keep the picture in sync during this adjustment with the Horizontal Hold.
Adjust the Horizontal Linearity slug (B4) for MINIMUM current indication on the 500MA meter.
Adjust the High Voltage Adjust for 23.5KV on the VTVM. Check the current reading on the meter. It should not exceed .8MA (19 watts).

AGC ADJUSTMENT

Tune in the strongest signal in the area. Connect the high side of a scope to point (E). Low side to chassis. Adjust the AGC control for 10 volts peak to peak on the scope.

NOISE INVERTER ADJUSTMENT

Connect the Vertical amplifier of the scope to point (L). Low side to chassis. Turn the Noise control fully counterclockwise. Turn slowly clockwise while observing the scope, when the tips of the sync pulses appear to be clipped, back off until the clipping just disappears.

COLOR AFC ALIGNMENT

Connect the Vertical amplifier of the scope to point (M). Low side to chassis. Connect the DC probe of the VTVM thru a 470K resistor to pin 2 (plate) of Chroma Sync Phase Detector. Common to chassis. Set the Tint control to the center of its range. Turn the Killer Threshold control fully counterclockwise. Connect a short clip from point (N) to chassis. Adjust A16 for maximum deflection on the VTVM. If the Chroma Reference Oscillator is not running, no reading will be obtained. In which case adjust A18 just enough to start the oscillator and then adjust A16. Adjust A17 for maximum deflection on the VTVM. Make sure the oscillator is running and locked in.
Connect a clip lead from point (O) to chassis. Disconnect the VTVM. Adjust A18 until the Color bars stand still on the screen or drift slowly by. Move the scope connection to point (P).
Remove the clip lead from point (O). Observe the bar pattern on the scope and retouch A17 if necessary to obtain proper response curve similar to R-Y in Fig. 12 with equal change when rotating the Tint control from one end to the other.
After this adjustment return the Tint control the nominal setting. Move the scope connection to point (R). If necessary, retouch A16 for proper B-Y signal as shown in Fig. 12.
Move scope connection to point (S). Check for proper G-Y signal and repeat adjustment of A17, A16 if necessary.
Remove all clip leads and test equipment. Switch to an unused channel and adjust the Killer Threshold control to the point where color just disappears from the noise pattern on the screen.

PRELIMINARY CONVERGENCE ADJUSTMENTS

Connect the output of a white dot generator to the antenna terminals. Preset all Red, Green and Blue Horizontal and Vertical Convergence controls and coils to the center of their ranges.
Adjust Red, Green and Blue Convergence magnets and the Lateral Magnet to produce a white dot in the center of the screen. Keep the screen in sharp focus during this adjustment. Switch the generator to standby position.

COLOR PURITY ADJUSTMENTS

If necessary, demagetize picture tube and associated components.
Set the red tabs of the Purity Magnet together. Set the Edge Purity Magnets so that the two magnets are in the same relative position one above the other. Loosen the yoke clamp and slide the deflection yoke to the rear as far as possible.
Shunt test points (R) and (S) to chassis thru individual 100K resistors.
Slide Purity Magnet around the neck of the picture tube and at the same time spread the red tabs apart to produce a uniform red screen area at the center of the screen.
Move the Yoke forward and adjust for best overall red screen without neck shadow.
Adjust so that any color impurities occur at the extreme edges of the screen.

Adjust the Screen controls for a white raster and adjust the Edge Purity Magnets for best edge purity. Maximum correction is obtained with the open ends of the magnets 180 degrees apart. Rotate both magnets simultaneously to achieve the desired results.

VERTICAL CONVERGENCE ADJUSTMENTS

Recheck the "Preliminary Convergence Adjustments" for correct setting of the Red, Green and Blue magnets and the Lateral Magnet to produce a white dot in the center of the screen.
Loosen the two screws holding the Convergence board, slide the board to the left and remove. Fasten the board to the top rail of the cabinet with the two screws provided. Place so that the controls face forward.
Switch the dot generator to vertical bars and adjust the Red and Green tilt controls for equal displacement of the Center bar at the top and bottom.
Adjust the Red and Green Amplitude controls until the red and green lines are straight. Gradually reduce the Amplitudes to converge the red, green and blue along the center lines, retouching the Red and Green Tilt controls to keep the lines parallel. The center line should converge to produce a white line from top to bottom or show slight displacement of the Red on one side and the green on the other with all three parallel from top to bottom.
Readjust the Convergence Magnets if necessary to superimpose the three parallel lines to produce a single white line from top to bottom.
Switch the generator to horizontal bars. Referring to the top and bottom bars as a reference, adjust the Blue Vertical Tilt and Amplitude controls for equal downward displacement of the blue horizontal from the extreme top and bottom lines of the raster. Reduce the Blue Vertical Amplitude control to converge all the lines at the center, retouching the Blue Vertical tilt SLIGHTLY, if necessary making all lines white at the center from top to bottom.

HORIZONTAL CONVERGENCE ADJUSTMENTS

Switch the generator to crosshatch pattern. If necessary, retouch convergence magnets to produce good convergence at the center of the screen.
Adjust coil B-1 so that the blue horizontal line at the right center of the screen is a straight line.
Adjust control B-2 for a straight blue line to the left of the raster. Adjust R-G-1 to make the vertical lines at the right side of the raster converge. Adjust R-G-2 to make the horizontal red and green lines at the right side of the screen converge. Readjust B-1 to make the blue lines at the right center fall on the red and green converged lines.
Retouch R-G-1 for convergence of the vertical lines at the right side.
Adjust control R-G-3 to make the vertical lines at the left side converge.
Adjust control R-G-4 to make the red and green horizontal lines at the left side of the screen converge.
Readjust B-2 to make the blue lines at the left center fall on the converged red and green lines.
The picture or pattern should now show proper convergence over the entire screen.

GRAY SCALE ADJUSTMENTS

Set Green and Blue Screen controls two-thirds clockwise from minimum.
Set the Green and Blue Background controls to the center of their ranges.
Set the Red Background control fully counterclockwise and do not change it from this point on. Tune in a station and then turn the Brightness and Contrast controls fully counterclockwise. Use a program which displays the full range of contrast conditions from high lights to low lights.
Advance the Brightness control to obtain a picture of normal brightness. The control will usually fall approximately two-thirds clockwise. DO NOT overload.
Adjust the Blue and Green Background controls to produce white in the highlight areas of the picture.
Reduce the Brightness to produce a low level brightness picture and observe the lowlight areas (dark objects) of the picture. Some color will prevail in the lowlight areas, as indicated below.

1. Yellow in the lowlight areas. Blue Screen must be turned clockwise.
2. Magenta in the lowlight areas. Green Screen must be turned clockwise.
3. Red in the lowlight areas. Blue and Green Screens must be turned clockwise.
4. Green in the lowlight areas. Green screen must be turned counterclockwise.
5. Blue in the lowlight areas. Blue Screen must be turned counterclockwise.
6. Cyan in the lowlight areas. Blue and Green Screens must be turned counterclockwise.

Depending upon which of the above conditions prevail, turn the appropriate control in the indicated direction until a gray picture is obtained, then SLIGHTLY beyond in the same direction.
Advance the Brightness control to produce a well lit picture. Adjust the Blue and Green Background controls for white in the highlight areas of the picture. DO NOT ADJUST THE RED BACKGROUND CONTROL. Return the Brightness control to the lowlight area and retouch the proper Screen controls for gray in the lowlight areas.
Check for proper tracking at all light levels and retouch as necessary being sure not to change Red Background control setting.

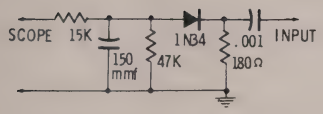


FIG. 1

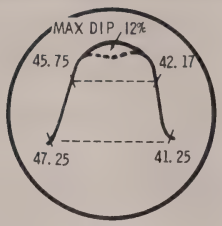


FIG. 2

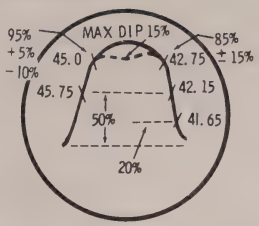


FIG. 3

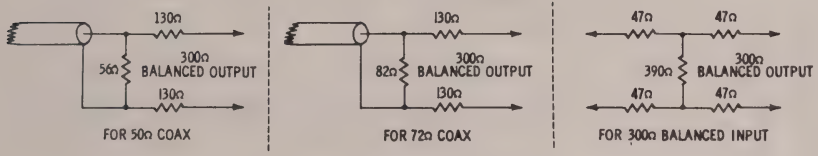


FIG. 4

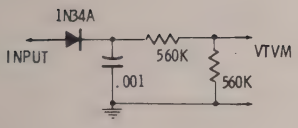


FIG. 5

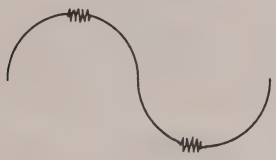


FIG. 6

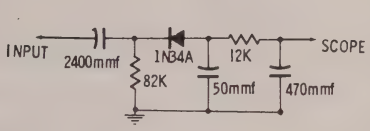


FIG. 7

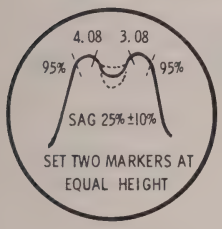


FIG. 8

FIG. 9

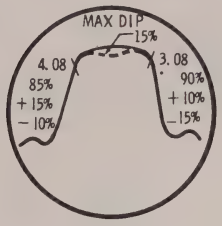


FIG. 10

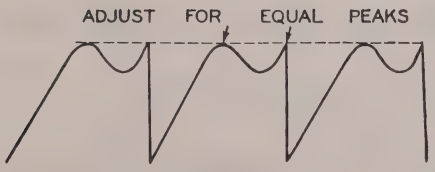


FIG. 11

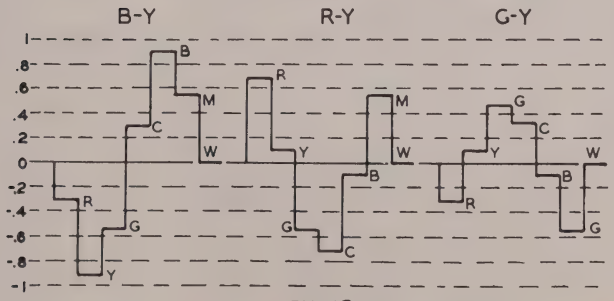


FIG. 12

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •	GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •

ITEM No.	USE	TYPE
V201	RF Amplifier	6BC8

ITEM No.	USE	TYPE
V202	Mixer-Osc.	6EA8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	18		DI-18	DD-180	L10Q18	CCD-180	CNO-418	10TS-Q18
C202	5		DI-5	DD-050	L10V5	CCD-050	GP550	10TS-V50
C203	27		DI-27	DD-270	L10Q27	CCD-270	CNO-427	10TS-Q27
C204	2			TCZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C205	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C206	.34-3							
C207	2.2			TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C208	270		DI-270	DD-271	L10T27	CCD-270	B-327	10TS-T27
C209	68 N750		N750-DI 68	DTN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C210	68 N750	5%		DTN-68	C10Q68U		CN7-468	10TCU-Q68
C211	.34-3							
C212	39 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	1 NPO	1%		TCZ-1			CNO-510	10TCC-V10
C215	62 N750	5%		TCN-62	C10Q62U		CNO-410	
C216	10	5%	NPO-DI 10	TCZ-10	C10Q1C		CNO-410	10TCC-Q10
C217	10 N220	5%				*		10TCR-Q10
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	100K	
R202	5600Ω	
R203	100K	
R204	1meg	
R205	1meg	
R206	4700Ω 3W	

ITEM No.	RATING	REMARKS
R207	470Ω	
R208	100K	
R209	100K	
R210	2700Ω	
R211	1000Ω	
R212	1000Ω	

ITEM No.	RATING	REMARKS
R213	5600Ω	
R214	6800Ω 1W	
R215	120Ω	
R216	100K	

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range. The adjustments should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 2 o'clock. Proceed in a counterclockwise direction. Adjust for best picture and sound.

VHF RF AND MIXER ALIGMENT

This portion of the tuner has been properly aligned at the factory and is very stable . Alignment of this portion should not be attempted in the field.

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6BZ6
V2	2nd Video IF Amp.	6BZ6
V3	3rd Video IF Amp-Sync Sep	6AW8A
V4	Video Amp. - AGC Keying	6AW8A
V5	Video Output	12BY7A
V6	Sound IF Amp. - Noise Inverter	6EA8
V7	Audio Detector	6DT6
V8	Audio Output	6AQ5A
V9	Sync Amp. - Vert. Mult.	6CG7
V10	Vert. Mult. - Vert. Output	6AQ5A
V11	Horiz. AFC - Horiz. Osc.	6CG7
V12	Horiz. Output	6DQ5
V13	Damper	6AU4GTA
V14	HV Rectifier	3A3
V15	Focus Rectifier	1V2
V16	HV Regulator	6BK4
V17	Chroma Bandpass Amp. - Color Killer	6EA8
V18	Burst Amp.	6EW6
V19	Chroma Sync Phase Det.	6AL5
V20	Chroma Ref. Osc. Control - Chroma Ref. Osc.	6EA8
V21	"X" Demodulator - "Z" Demodulator	12AZ7
V22	R-Y Amp. - B-Y Amp.	6CG7
V23	Horiz. Blanking Amp. - G-Y Amp.	6CG7

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V24	21CYP22		21CYP22 ①			① Aluminized

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	160	250	67B43-3	AFH1-31-75	XA0315	FP131	TMS-34	TVL-1540	
C2A	▲160	250	67B44-7	AFH3-178-80	D0360	FP341.6		TVLS-3711.2*	
B	■50	450			BR5045				
C	▲50	50							
C3A	▲80	450	67B44-2	AFH3-182-80	B0489	FP342.8	TMD-93	TVLS-3723.7*	
B	■50	350			BR10035		TD-100-200		
C	▲100	200							
C4	2	350	67A45-59	PRS1705	BR245	TC595	TD-2-450	TVA-1701	
C5	40	25	67B46-6	PRS1470	BR4015	TC48	TD-40-150	TVA-1413	
C6	8	10NP		PRS-AC6200	BBR8-150	TCN108		TVANS-1112 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C8	9 NPO ±.25mmf	#65B61-310			C10V9C			
C9	150 NPO 5%		NPO-DI 150	DTZ-150			CNO-315	10TCC-T15
C10	680 N2200 10%	#65B60-7				*		
C11	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C12	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	330 10%		DL-330	DD-331	L10T33	CCD-331	B-333	10TS-T33
C15	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	2 N3300 ±.25mmf	#65B57-11				*		
C18	560 N1500 10%					*		
C19	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C20	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C21	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C22	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C23	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C24	22 NPO 10%		NPO-DI 22	DTZ-22	C10Q22C	CCTO-220	CNO-422	10TCC-Q22
C25	100 5%			DTZ-100	C10T1C	CCTO-101	CNO-310	10TCC-T10
C26	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C27	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C28	.22 200V		P288N-22		CUB2P22	2DP-2-224	GEM-2022	2TM-P22
C29	390 10%		DI-390		L10T39	CCD-391	GP339	10TS-T39
C30	1500 10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C31	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C32	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C33	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C34	.001 1600V		P1884CM-001		CUB16D1	16DP-1-102	GEM-1621	MB-D1
C35	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	1.5 N3300 ±.25mmf	#65B57-4				*		
C37	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C38	5 N1500 ±.5mmf	#65B58-3				*		
C39	1500 10%		DI-1500		PM6D15	CCD-152	GP215	10TS-D15
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	560 10%		DI-560	DD-561	1R5T56	CCD-561	GP356	10TS-T56
C42	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C46	1000		BPD-01	DD-103	BYA10D1	CCD-102	B-210	5HK-D10
C47	.0047 600V 10%		V84C6D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C48	.0068 400V		P488N-0068	D6-682	CUB6D68	6DP-1-682	GEM-6268	6TM-D68
C49	.0018 600V 10%		V84C6D2-10%	D6-182	PM6D2	6DP-1-202	GP218	6TM-D2
C50	.0027 1600V 10%					16DP-2-302	GEM-1623	
C51	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C52	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C53	.1 400V 10%		V84C4P1-10%		PM4P1	4DP-3-104	GEM-1001	4TM-P1
C54	33 N750 10%		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C55	.033 400V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: ARVOVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C54	390	10%		DI-390	DD-391		CCD-391	GF3N5	10TS-T39
C55	.01	400V 10%		W54C4E-10%			4DP-1-103	GEM-4611	4TM-S
C58	.0082	400V 10%		P84C4M-0082			4DP-2-822	GEM-4611	4TM-S82
C60	.0056	400V 10%					6DP-1-562	GEM-46256	6TS-D56
C80	10000			BPD-01	DD-103	BYA10E	CCD-B10	B-10	5HK-S0
C81	.01	600V 10%		W54C6B-10%		P84E6	6DP-2-103	GEM-4611	6TM-S
C83	.033	400V 10%		W54C4S33-10%		P84E4S3	4DP-2-333	GEM-46133	4TM-S33
C85	.056	600V 10%		P84C4M-057		LRS784	6DP-3-563		6TM-S56
C94	.001	3000V 10%	#6AB38-3						
C96	.12	400V 10%							
C97	.47	200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C97	.01	400V 10%		W54C4R-10%		P84E4	4DP-1-103	GEM-4611	4TM-S
C98	.47	200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C99	68	3000V 10%				HVA2CQ68	VCM-30-680K	3DY-468	
C70	82	N750 10%	TCN-82			C10Q82U	CCT-820	CNT-482	10TCU-Q82
C71	1000		BPD-001		DD-102	BYA10DE	CCD-102	B-210	5HK-D1
C73	.0033	600V	P688N-0033		D6-332	CUB6Q33	6DP-1-332	GEM-6233	6TM-D33
C74	.01	600V	P688N-01				6DP-2-103	GEM-611	6TM-S
C81			P688N-1			DF-104	CUB6P1	GEM-601	6TM-S
C81	.047	600V	P688N-047		DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C82	.047	600V	P688N-047		DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C83	.47	200V	P288N-47			CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C84	.47	200V	P288N-47			CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C86	33		DI-33		DD-230	LOQ33	CCD-230	GP433	10TS-Q33
C86	.15	300V 10%	W54C2F15-10%			P84C2F15	2DP-3-154	GEM-2015	2TM-P15
C87	.1	600V 10%	W54C6B-10%			P84E6	6DP-4-104	GEM-6104	6TM-P1
C88	56	6000V	HVD-30-56		DD60-560		6CCD-560	6DY-456	60GA-Q56
C89	.0033	600V	P688N-0033		D6-332	CUB6Q33	6DP-1-332	GEM-6233	6TM-D33
C90	10	3000V	HVD-30-100		DD30-101	HVB2QT1	3CCD-101	3EV-310	30GA-T10
C91	.047	200V	P288N-047		DD-503	CUB2S47	2DP-3-473	GEM-4147	2TM-S47
C92	1000		BPD-01		DD-103	BYA10E	CCD-103	B-110	5HK-S0
C93	.047	200V	P288N-047		DD-503	CUB2S47	2DP-3-473	GEM-4147	2TM-S47
C94	130	N750	N750-S1 120		TCN-120	C10T12U	CCT-N-121	CNT-S12	10TCU-T12
C95	27	NPO 10%	NPO-S1 27		TCZ-27	C10Q27C	CCT0-270	CNO-447	10TCC-Q27
C96	10000		BPD-01		DD-103	BYA10E	CCD-103	B-110	5HK-S0
C97	1000		BPD-001		DD-102	BYA10DE	CCD-102	B-210	5HK-S00
C98	120	N2200 10%	#6SB80-16				*		
C99	330	5%		P287T33		CM-19B-331J	CM-19B-331J		MS-331
C100	330	5%		P287T33		CM-19B-331J	CM-19B-331J		MS-331
C101	10000			BPD-01	DD-103	BYA10E	CCD-103	B-110	5HK-S0
C102	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C103	56	NPO 10%	(230mmf-5%)†	NPO-D2 10	DT2-10	C10Q5C	CCT0-100	CNO-440	10TCC-Q10
C104	220			DI-220	DD-221	LOT22	CCD-221	B-322	10TS-T22
C105	330	10%		DI-330	DD-331	LOS33	CCD-331	GP433	10TS-T33
C106	.5	s. 5mmf			DT2-4R7	C10V4C	CCT0-4R7	CNO-547	10TCC-V47
C107	10000			BPD-01		BYA10E	CCD-103	B-110	5HK-S0
C108	18	NPO 10%		NPO-DI 18		DT2-18	CCD-180	CNO-418	10TCC-Q18
C109	10000			BPD-01	DD-103	BYA10E	CCD-103	B-110	5HK-S0
C110	220	N750 10%		N750-DI 220	TCN-120	C10T22U	CCT0-221	CNT-322	10TCU-T22
C111	33	10%		DI-33	DD-330	LOQ33	CCD-330	GP433	10TS-Q33
C113	10000			BPD-01	DD-103	BYA10E	CCD-102	B-10	5HK-S00
C114	33	NPO 10%		NPO-DI 33	DT2-33	C10Q33C	CCT0-330	CNO-433	10TCC-Q33
C116	.01	600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S
C118	.15	400V		P488N-15		CUB4P1	4DP-4-154	GEM-4E33	4TM-P15
C119	33	NPO 10%		NPO-DI 33	DT2-33	C10Q33C	CCT0-330	CNO-433	10TCC-Q33
C117	.047	400V		P488N-047		DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C120	1000	5%		1469-0001			1R5DI	CM-19B-102J	MC2E5	MS-2I
C121	.047	200V		P288N-047		DD-503	CUB2S47	2DP-3-473	GEM-4147	2TM-S47
C122	.01	600V		P688N-01		D6-103	CUB6S1	6DP-3-103	GEM-611	6TM-S
C123	.15	400V		P488N-15			CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C124	.01	600V		P688N-01		D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S
C125	.15	400V		P488N-15			CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C126	.1	N750	almmf				CU0Y7U		CNT-568	
C127	.22	400V	10%	W54C4P22-10%			PM4P22	4DP-5-224	GEM-4522	4TM-P22
C128	1000			BPD-001	DD-102		BYA10DE	CCD-102	B-210	5HK-D0
C129	1000			BPD-001	DD-102		BYA10DE	CCD-102	B-210	5HK-D0
C130	.082	200V	10%					2DP-6-823	GEM-2083	2WP-S82
C129	.1	200V	10%	W54C2P1-10%			PM2P1	2DP-3-104	GEM-201	2TM-P1
C130	.1	200V	10%	W54C2P1-10%			PM2P1	2DP-3-104	GEM-201	2TM-P1
C131	.1	200V	10%	W54C2P1-10%			PM2P1	2DP-3-104	GEM-201	2TM-P1
C133	.056	200V	10%	P284C4M-057				4DP-3-563		2WP-S56
C133	560	2000V	10%	#6SB59-17				VCM-35-561K		
C134	100	3000V	5%					HVDM-43-101J	3DY-S10	
C135	560	2000V	10%	#6SB59-17				VCM-35-561K		
C136	47	4000V	10%					HVDM-42-470J	6DY-447	
C137	1000			BPD-001	DD-102		BYA10DE	CCD-102	B-210	5HK-D10
C138	10000			BPD-01	DD-103		BYA10E	CCD-103	B-110	5HK-S0
C139	10000			BPD-01	DD-103		BYA10E	CCD-103	B-110	5HK-S0
C140	.047	600V		P688N-047	DD-503		CUB6S47	6DP-3-473	GEM-6147	6TM-S47

Admiral Part Number.
* Not normally in distributor's stock. Available thru distributor or order to manufacturer.
† Alternate Value.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS—IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	½	75B65-22					Color Intensity
B	1meg	½				† (▽)-1348	* (U)E4123-8	Volume
	120K Tap							
C	Switch							Push-Pull, Off-On
R2A	1200Ω	½	75B65-21	F1-7		† (▽)-1268	■ (U)E4124	Color Fidelity (Hue)
B	250K			R2-34				Brightness
R3A	2.5meg	½	75B63-3	F1-77			▲ (U)E4122	Tone
B	5meg			R2-83				Height
R4A	500Ω	½	75C67-29	F1-1			▲ (U)E4126	Contrast
B	100K			R2-31				Vert. Linearity
R5A	2.5meg	½	75C67-30	F1-76			▪ (U)E4125	Vert. Hold
B	1meg			R2-51				Killer Threshold
R8A	2.5meg	½	75B61-13	B47-2.5meg-S	B11-239	SU-565		Noise Inverter
B	Shaft			AK-1	Not Req.	Not Req.		
R7A	1meg	½	75B61-16	BX-69	B47-1meg-S	B11-137		AGC
B	Shaft			Not Req.	Not Req.	TM4		Not Req.

† "Concentrictt" Equivalent: K-16 Kit with Base Elements and Shafts: B11-103, P17-112 (Panel) B13-137X, R23-202 (Rear)
† "Concentrictt" Equivalent: K-8 Kit with Base Elements and Shafts: B17-208, P17-112 (Panel) (Not available as a factory assembled unit). B11-130, R1-200 (Rear)
■ "STA-LOC" Equivalent: FA152R, RU3541, OF1375, IS2062.
▲ "STA-LOC" Equivalent: FA2551, RU561, OF1687, IS2125.
▪ "STA-LOC" Equivalent: FA251, RU151, OF1687, IK525.
• "STA-LOC" Equivalent: FA255L, RU161, OF1681, IK515.
* "STA-LOC" Equivalent: FA251, RUP167153, OF1375.

CONTROLS (cont)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS—IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R8A	700K	½	75B61-23	AB-66	A47-750K-S	B11-136	PTA754L	Red Background
B	Shaft			AK-1	FKS-1/4	TM4	Not Req.	
R9A	1meg	½	75B61-10	BX-69	B47-1meg-S	B11-137	SU-54	Green Screen
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R10A	700K	½	75B61-23	AB-66	A47-750K-S	B11-136	PTA754L	Green Background
B	Shaft			AK-1	FKS-1/4	TM4	Not Req.	
R11A	1meg	½	75B61-10	BX-69	B47-1meg-S	B11-137	SU-54	Blue Screen
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R12A	700K	½	75B61-23	AB-66	A47-750K-S	B11-136	PTA754L	Blue Background
B	Shaft			AK-1	FKS-1/4	TM4	Not Req.	
R13A	1Ω	2(WW)	75B61-12	WW-150	AB2-B	WL-015X	R1EL	Vert. Centering
B	Shaft			Not Req.	FKS-1/4	SK4	Not Req.	
R14	100K	2(WW)	75B60-9	WW-104			M100MPK	Focus
R15	100Ω	2(WW)	75B64-3				PF1J00A	Horiz. Centering
R16A	500K	½	75B66-1	BX-59	B47-500K-S	B11-133	SU-50	H. V. Adjust
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R17	100Ω	2(WW)	75B64-5					Vert. Red Amp.
R18	120Ω	2(WW)	75B64-5					Vert. Green Amp.
R19	130Ω	2(WW)	75B64-5					Vert. Blue Amp.
R20	30Ω	2(WW)	75B64-6					Vert. Red Tilt
R21	30Ω	2(WW)	75B64-6					Vert. Green Tilt
R22	60Ω	2(WW)	75B64-2				PF1J00A	Vert. Blue Tilt
R23	60Ω	2(WW)	75B64-3				PF1J00A	Left Horiz. R-G-3
R24	60Ω	2(WW)	75B64-3				PF1J00A	Left Horiz. R-G-4
R25	130Ω	2(WW)	75B64-5					Left Horiz. B-2
R28A	750Ω	½	75B60-8				PTA-75L	Sound Reject
B	Shaft					B11-105	TM4	
R27	1Ω	1/4	75B66-1			B11-103	Not Req.	Sound Adjust

Admiral Part Number.
* Alternate Value.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R29	2.7meg	
R29	3300Ω	
R30	1000Ω	
R31	100Ω	
R32	47Ω	
R33	1000Ω	
R34	150Ω	
R35	82Ω	
R36	3300Ω 10W	#6IB30-81
R37	18K 4W	#6IA34-55
R38	470Ω	
R39	5600Ω 4W	
R40	150Ω	
R41	10K	
R42	6200Ω	
R43	12K	
R44	3.9meg	
R45	6800Ω 7W	#6IA32-145
R46	220Ω	
R47	150K	
R48	22K 2W	
R49	56Ω	
R50	1500Ω	
R51	1800Ω	
R52	47K	
R53	62K	
R54	270K	
R55	56K	
R56	22K 2W	
R57	220Ω	
R58	68Ω	
R59	1000Ω	
R60	2700Ω	
R61	1800Ω 3W	
R62	2700Ω 7W	#6IA32-135
R63	100K 2W	
R64	100K 2W	
R65	100K 2W	
R66	56K 2W	
R67	82K 2W	
R68	390K	
R69	330K	
R70	330K	
R71	3.3meg	
R72	1meg	
R73	100Ω	
R74	22K	
R75	39K	
R78	180K	
R77	10meg	
R78	3300Ω 3W	
R79	82Ω	
R80	3300Ω 3W	
R81	470Ω	
R82	470K	
R83	1meg	
R84	1meg	

ITEM No.	RATING	REMARKS
R85	150K	
R86	47K	
R87	2.4meg	
R88	3.4meg	
R89	1meg	
R90	560K	
R91	68K	
R92	10K 2W	
R93	8200Ω	
R94	100K	
R95	82K	
R96	6.8meg	
R97	1meg	
R98	1.5meg	
R99	1.5meg	
R100	22K	
R101	22K 2W	
R102	470K	
R103	2.2meg	
R104	47K 1W	
R105	120K	
R106	82KΩ	
R107	47K	
R108	15K	
R109	22K	
R110	330K	
R111	82K	
R112	680K	
R113	820KΩ	
R114	270K 1W	
R115	1meg	
R116	68K	
R117	100K 1W	
R118	33K 2W	
R119	10meg	
R120	100Ω	
R121	47Ω	
R122	56K 2W	
R123	15K 7W	#6IA32-54
R124	100K	
R125	6.8Ω	
R126	68K 2W	
R127	27K	
R128	22meg 2W	
R129	33meg 2W	
R130	22meg 2W	
R131	1meg 2W	
R132	100meg 1W	
R133	1.5meg 1W	
R134	1.5meg 1W	
R135	10K	
R136	47Ω	
R137	270Ω	
R138	270Ω	
R139	4700Ω 2W	
R140	(5Ω Cold)	#6IA37-3
R141	2700Ω 7W	#6IA32-35

ITEM No.	RATING	REMARKS
R142	1meg	
R143	120K 1W	
R144	10meg	
R145	150K	
R146	470K	
R147	470Ω	
R148	820Ω	
R149	1500Ω	
R150	33K	
R151	1000Ω	
R152	27K	
R153	22meg	
R154	470K	
R155	470K	
R156	6.8meg	
R157	220Ω	270Ω *
R158	33K	
R159	1500Ω	
R160	56K 2W	15K *
R161	47K	
R162	680Ω	
R163	47K 1W	
R164	820Ω	
R165	47K 1W	
R166	3900Ω 1W	
R167	3900Ω 1W	
R168	36Ω 1W	
R169	820Ω 1W	
R170	1meg	
R171	15K 3W	
R172	120K	
R173	470K	
R174	1meg	
R175	15K 3W	
R176	120K	
R177	470K	
R178	560Ω 2W	
R179	120K 1W	
R180	39K 4W	
R181	3300Ω 1W	
R182	1meg	
R183	47K	
R184	15K 3W	
R185	120K	
R186	470K	
R187	100Ω 1W	
R188	100Ω 1W	
R189	100Ω 1W	
R190	82Ω 1W	
R191	100Ω	
R192	1600Ω 10W	#6IB50-54
R193	1600Ω 10W	#6IB50-54
R194	10K 1W	
R195	820K	
R196	.49Ω Hot 79Ω Cold	#6IB36-2

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	1st Video IF	72D222-1						
L2	2nd Video IF	72D215-2						
L3	3rd Video IF	72D215-3						
L4	4th Video IF	72D222-2						
L5	Fil. Choke	-						
L6	3rd Video IF	72D221-3						
L7	Fil. Choke	-						
L8	RF Choke	73B45-251	19-2864	19-2864	BC-566	4622		12uh
L9A	4th Video IF	72D230-1						
B	41.25MC Trap	-						
L10	RF Choke	73B44-8						12uh
L11	4.5MC Trap	72D216-4						
L12	RF Choke	73B45-231						1.8uh
L13	Series Peaking Coil	73B46-21	19-4060 *	19-4060 *	TV-193 *	6110 *		82uh ①
L14	Shunt Peaking Coil	73B46-6	19-3180	19-3180	TV-194	6180	VP-5	180uh
L15	Series Peaking Coil	73B46-16	19-3180 ▲	19-3180 ▲	TV-194 ▲	6180 ▲	VP-5 ▲	180uh ③
L16	Shunt Peaking Coil	73B46-8	19-3180	19-3180	TV-194	6180	VP-5	180uh
L17	Series Peaking Coil	73B46-33	19-3280 ▪	19-3280 ▪	TV-185 ▪	6181 ▪	VP-6 ▪	250uh ③
L18	Series Peaking Coil	73B46-31	19-3280 ▲	19-3280 ▲	TV-185 ▲	6181 ▲	VP-6 ▲	250uh ④
L19	Shunt Peaking Coil	73B46-19	19-3060	19-3060	TV-193	6110		82uh
L20	RF Choke	73B45-201	19-3864	19-3864	BC-566	4622		12uh
L21	1st Sound IF	72D219-1						
L22	2nd Sound IF	72D216-2						
L23	Quadrature Coil	72D219-2						
L24	1st Chroma Grid Coil	72D211-2						Tap ⑤ 2.5Ω
L25	1st Chroma Bandpass Trans.	72D213-1						
L26	Burst Amp. Trans.	72D210-1						Sec. tap ⑥ 1.8Ω
L27	Chroma Ref. Osc. Control Plate Coil	72D214-1						
L28	Chroma Ref. Osc.	72D213-1						
L29	RF Choke	73A47-3	19-1000	19-1000	BC-561	4603		1.1uh
L30	Series Peaking Coil	73B43-11	19-3660	19-3660	TV-205	6146		630uh
L31	Series Peaking Coil	73B43-11	19-3660	19-3660	TV-205	6146		630uh
L32	RF Choke	73B45-251	19-2864	19-2864	BC-566	4622		12uh
L33	RF Choke	73B45-251	19-2864	19-2864	BC-566	4622		12uh

* Parallel with 1meg resistor.
▲ Parallel with 1800Ω resistor.
▪ Parallel with 820Ω resistor.
① Wound on 1meg resistor.
② Wound on 1800Ω resistor.
③ Wound on 820Ω resistor.
④ Wound on 15K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L34	81Ω		94B177-3	H8-7	TV-165			H8-7	Horiz. Osc. Tap ⑤ 29Ω
L35	45Ω		94B174-8						Horiz. Waveform

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L36	.440A	17Ω	.7 Hy.	74B24-3						C-40X

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L37	Horiz. Linearity 3- 5MHz	94A176-1								
L38	Right Horiz. Red- Green #1 3.5-7.5MHz	94B175-1								
L39	Horiz. Blue #1 3.5-7.5MH	94B175-1								
L40	Right Horiz. Red- Green #2 2.5-4.5MHz	94B175-2								
L41	Convergence Yoke Assembly									
A	Green Coil	750C237-504								
B	Blue Coil	750C237-504								
C	Red Coil	750C237-504								

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	SEC. 4	SEC. 5	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V	150V ① 2.75A	8.3V ① 1.5A	6.3V ① 2A			80BT2-1						
				6.3V ① 13A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	79B89-2							
T3	Vert. Convergence Choke	79B35-3							

ADMIRAL CHASSIS 25A6, 25B6, 25UA6, 25UB6

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMERS (SWEEP CIRCUITS) (cont)

ITEM No.	USE	REPLACEMENT DATA							
		ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T4	Yoke Horiz. (12MH) Vert. (33MH)	94D180-2							
T5	Horiz. Output	79D90-2							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	7600Ω	3-4Ω	79B87-8	26S48	A-3020	AU-604	A-3849	26S48	S-9Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3-4Ω	78C167-506 ①	69A3	① Models C7IN31, 37, C7IUN31, 37, L7IN41, 42, 43, 52, 57, L7IUN41, 42, 43, 52, & 57
SP2	3½"	PM	8-10Ω	78C164-2 ①	3AI5TZ9	
SP3	3½"	PM	8-10Ω	78C164-2 ②	3AI5TZ9	② Models L7IN41, 42, 43, 52, 57, L7IUN41, 42, 43, 52, 57
	4" x 6"	PM	3-4Ω	78C165-4 ③		③ Models T7IN10, 12, 13, T7IUN10, 12, 13
	6" x 9"	PM	3-4Ω	78D166-8 ④		④ Models C7IN21, 22, 23, C7IUN21, 22, 23

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ADMIRAL PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.440A	93B20-1 ①	SD-500 ①	HA-505 ①	F6 ①	SR500 ①	① Silicon Type
M2	.440A	93B20-1 ①	SD-500 ①	HA-505 ①	F6 ①	SR500 ①	② Selenium Type
M3		93B19-1 ②	59-0639				

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ADMIRAL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	2½" #21	wire	84A23-502					
M5	C	3½A 250V	84A20-5	84A21-7	33203.5 (C 3½A 250V)	346007	C 3½	HC 2½ to 3½
M6	3AG	3/4A 250V P/T	84A22-6		318.750 (3AG 3/4A 250V P/T)		GJV 3/4	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		ADMIRAL PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M7		93C21-6	1N60	1N60	1N295	
M8		93C21-6	1N60	1N60	1N295	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M9	Tuner	94A181-1	VHF, Used in Chassis 25A6
	Tuner	94A182-1	VHF, used in Chassis 25B6
	Tuner	94A181-2	VHF with UHF Provisions, Chassis 25UA6
	Tuner	94A182-2	VHF with UHF Provisions, Chassis 25UB6
	Tuner	94D183-1	UHF
	Tuner	94D183-2	UHF (Alternate)
M10	Delay Line	72B217-1	
M11	Crystal	93C22-1	3.58MC
M12	Magnet	94B178-1	Convergence (3 used)
M13	Magnet	750A242-501	Lateral Assembly
M14	Magnet	94A185-1	Purity
M15	Magnet	94C186-1	Color Equalizer Ring, Picture Tube Mounting Ring
M16	Purity Coil Ring	94B179-1	
	Printed Board	750A228-1	Sound, Less Tubes
	Printed Board	750A229-1	Video IF, Less Tubes
	Printed Board	750A231-1	Video, Less Tubes
	Printed Board	750A230-1	Vertical, Less Tubes
	Printed Board	750A232-1	Horizontal, Less Tubes
	Printed Board	750A233-1	Convergence, Less Tubes

PARTS LIST AND DESCRIPTIONS (Continued)

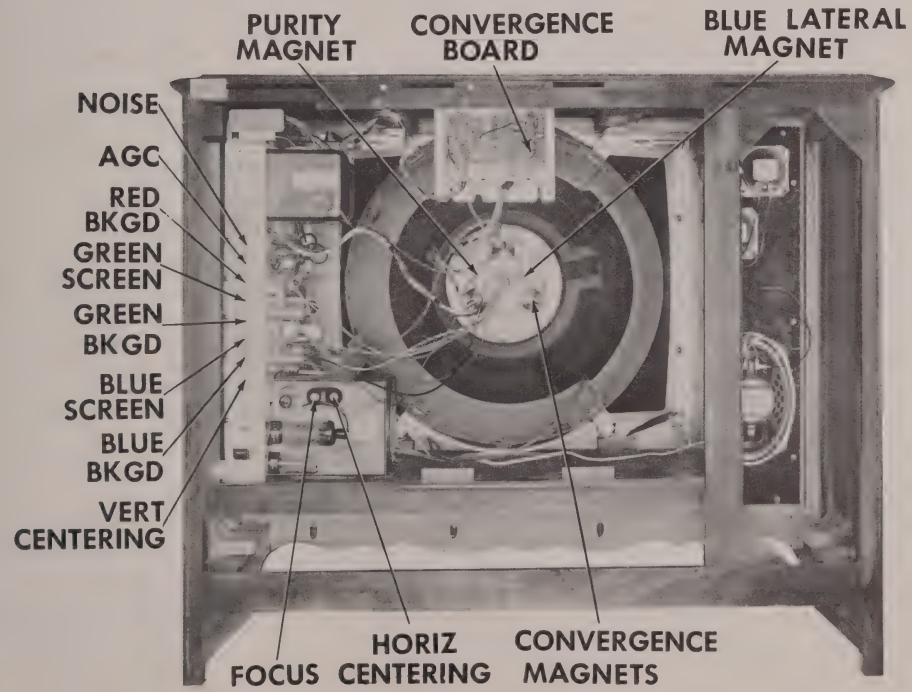
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Mask	23E388-5	Picture Tube
Safety Glass	21B132-5	
Knob	20C32-3	VHF Channel Selector
Knob	20C37-2	UHF Channel Selector
Knob	33B374-2	Fine Tuning, Models T7IN10, 12, 13, T7IUN10, 12, 13
Knob	33B374-1	Fine Tuning, Models C7IN21, 22, 23, 31, 37, C7IUN21, 22, 23, 31, 37
Knob	33C375-3	Channel Indicator, UHF
Knob	20C37-3	Off-On Volume
Knob	20C37-1	Brightness
Knob	33B376-1	Contrast, Vertical Hold, Horizontal Hold, Tone
Knob	33C375-1	Color Fidelity
Knob	33C375-2	Color Intensity
Cabinet	34E157-506	Black, Models T7IN10, T7IUN10
Cabinet	34E157-507	Mahogany, Models T7IN12, T7IUN12
Cabinet	34E157-508	Blond, Models T7IN13, T7IUN13
Cabinet	35E582-1	Walnut, Models C7IN21, C7IUN21
Cabinet	35E582-2	Mahogany, Models C7IN22, C7IUN22
Cabinet	35E582-3	Blond, Models C7IN23, C7IUN23
Cabinet	35E583-1	Oiled Walnut, Models C7IN31, C7IUN31
Cabinet	35E583-7	Cherry, Models C7IN37, C7IUN37
Cabinet	35E584-1	Oiled Walnut, Models L7IN41, L7IUN41
Cabinet	35E584-2	Mahogany, Models L7IN42, L7IUN42
Cabinet	35E584-3	Blond, Models L7IN43, L7IUN43
Cabinet	35E585-2	Mahogany, Models L7IN52, L7IUN52
Cabinet	35E585-7	Cherry, Models L7IN57, L7IUN57

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



CABINET—REAR VIEW

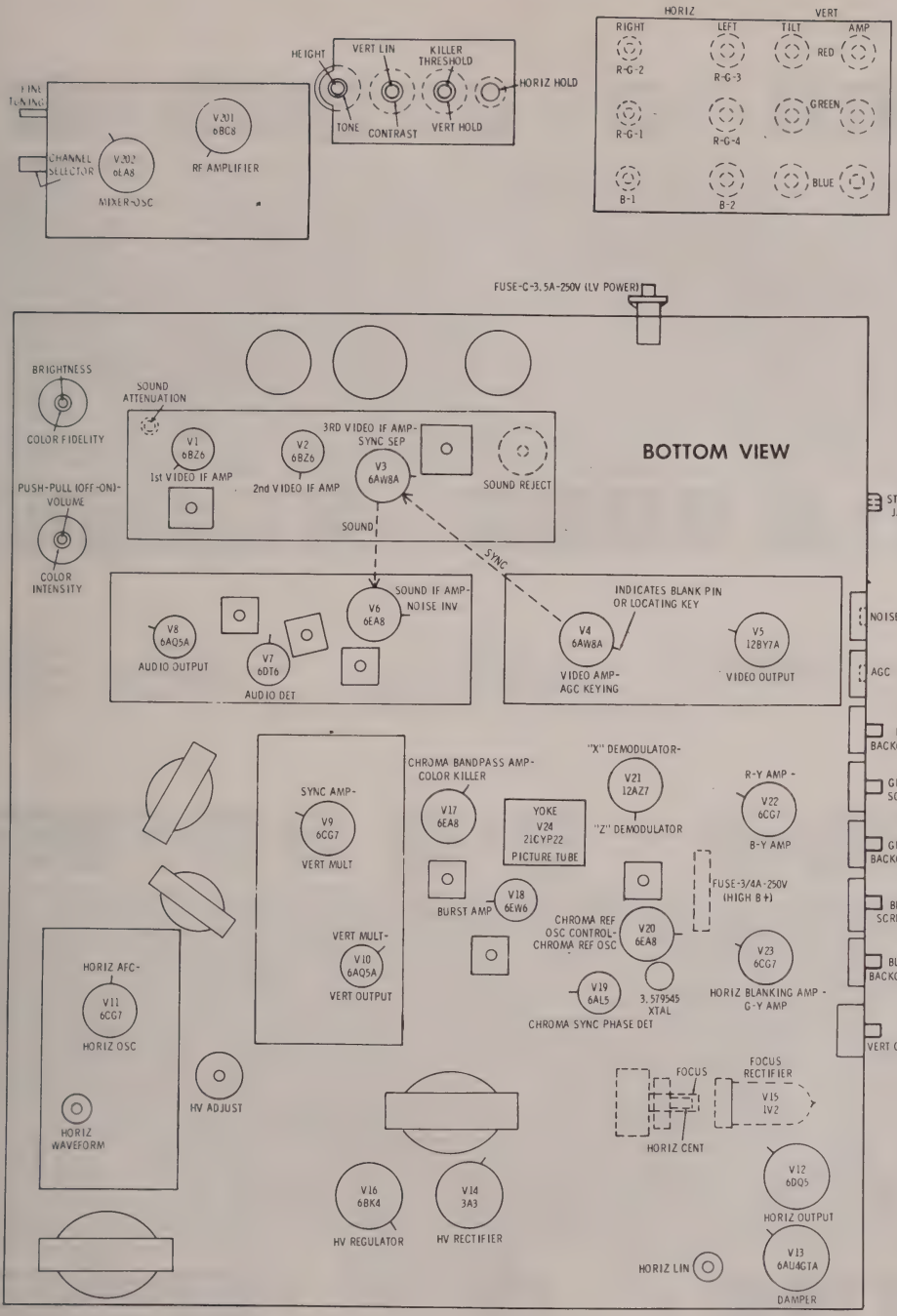
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	100K	47Ω	0Ω	.1Ω	†4000Ω	†4000Ω	0Ω		
V2	6BZ6	100K	82Ω	.1Ω	0Ω	†4000Ω	†4000Ω	0Ω		
V3	6AW8A	0Ω	10meg	▪1meg	.1Ω	0Ω	150Ω	.1Ω	†6900Ω	†6900Ω
V4	6AW8A	▪0Ω	●100K	600K	.1Ω	0Ω	900Ω	5500Ω	†23K	†7600Ω
V5	12BY7A	●400Ω	●350K	0Ω	.1Ω	.1Ω	0Ω	†4500Ω	†25K	0Ω
V6	6EA8	†30K	6.5Ω	▪3300Ω	.1Ω	0Ω	▪3300Ω	82Ω	900Ω	●1.1meg
V7	6DT6	4.6Ω	470Ω	.1Ω	0Ω	†600K	▪3300Ω	470K		
V8	6AQ5A	1.2meg	¶60K	.1Ω	0Ω	†365Ω	†800Ω	1.2meg		
V9	6CG7	▪10K	33K	0Ω	.1Ω	0Ω	●†5meg	●2.5meg	0Ω	0Ω
V10	6AQ5A	2.3meg	26Ω	0Ω	.1Ω	†3100Ω	†2700Ω	2.3meg		
V11	6CG7	†17Ω	330K	500K	.1Ω	0Ω	†33K	550K	0Ω	0Ω
V12	6DQ5	10meg	0Ω	0Ω	†13K	10meg	0Ω	.1Ω	†13K	TOP CAP †15Ω
V13	6AU4GTA	NC	NC	¶350K	NC	†9.5Ω	NC	0Ω	.1Ω	
V14	3A3		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP †610Ω
V15	1V2	TP	NC	NC	66meg	66meg	66meg	NC	NC	●†90K
V16	6BK4	†9Ω	¶25K	NC	NC	1meg	NC	¶25K	NC	TOP CAP INF
V17	6EA8	500K	320K	†1300Ω	.1Ω	0Ω	†1300Ω	820Ω	0Ω	5meg
V18	6EW6	33K	27K	0Ω	.1Ω	†1000Ω	†800Ω	0Ω		
V19	6AL5	4.5meg	5meg	0Ω	.1Ω	220Ω	0Ω	220Ω		
V20	6EA8	†30K	47K	†47K	0Ω	.1Ω	†9000Ω	0Ω	680Ω	4.5meg
V21	12AZ7	†4700Ω	● 130Ω	860Ω	.1Ω	.1Ω	†4700Ω	●130Ω	860Ω	0Ω
V22	6CG7	†15K	1meg	560Ω	.1Ω	0Ω	†13K	1meg	560Ω	0Ω
V23	6CG7	†39K	120K	820Ω	.1Ω	0Ω	†13K	1meg	560Ω	0Ω
V24	21CYP22	¶25K	†120K	†110K	†7200Ω	†2700Ω	†120K	●†550K	NC	66meg
			Pin 10 NC	Pin 11 ●†550K	Pin 12 †110K	Pin 13 †2700Ω	Pin 14 ¶25K			
V201	6BC8	†5500Ω	550K	650K	0Ω	.1Ω	650K	800K	0Ω	0Ω
V202	6EA8	†7600Ω	100K	INF	0Ω	.1Ω	INF	0Ω	INF	INF
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

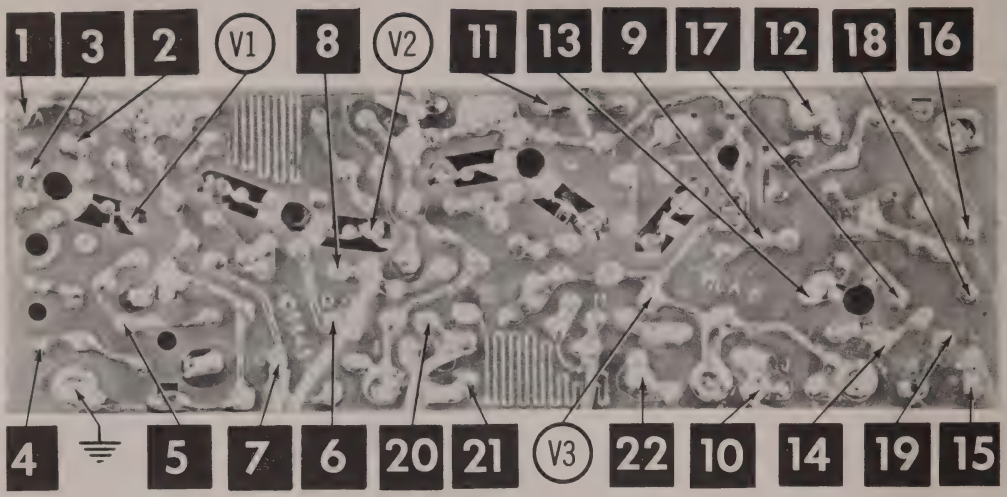
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM OUTPUT OF M2.
▪ MEASURED FROM 140V SOURCE.
† MEASURED FROM PIN 3 OF V13.

NC NO CONNECTION
TP TIE POINT

TUBE PLACEMENT CHART



CircuiTrace Numbers 1 thru 22

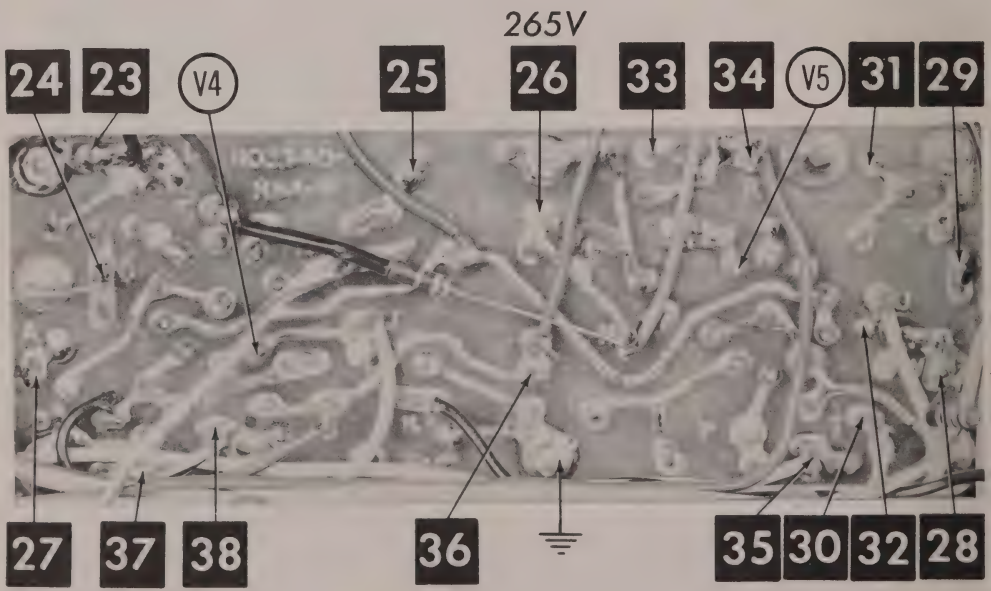


A Howard W. Sams CIRCUITRACE® Photo

VIDEO IF
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

CircuiTrace Numbers 23 thru 38



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VIDEO
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

CircuiTrace Numbers 39 thru 48

A Howard W. Sams CIRCUITRACE® Photo

SOUND
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

CircuiTrace Numbers 49 thru 65

A Howard W. Sams CIRCUITRACE® Photo

VERT. PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

CircuiTrace Numbers 66 thru 76

HORIZ. PRINTED BOARD

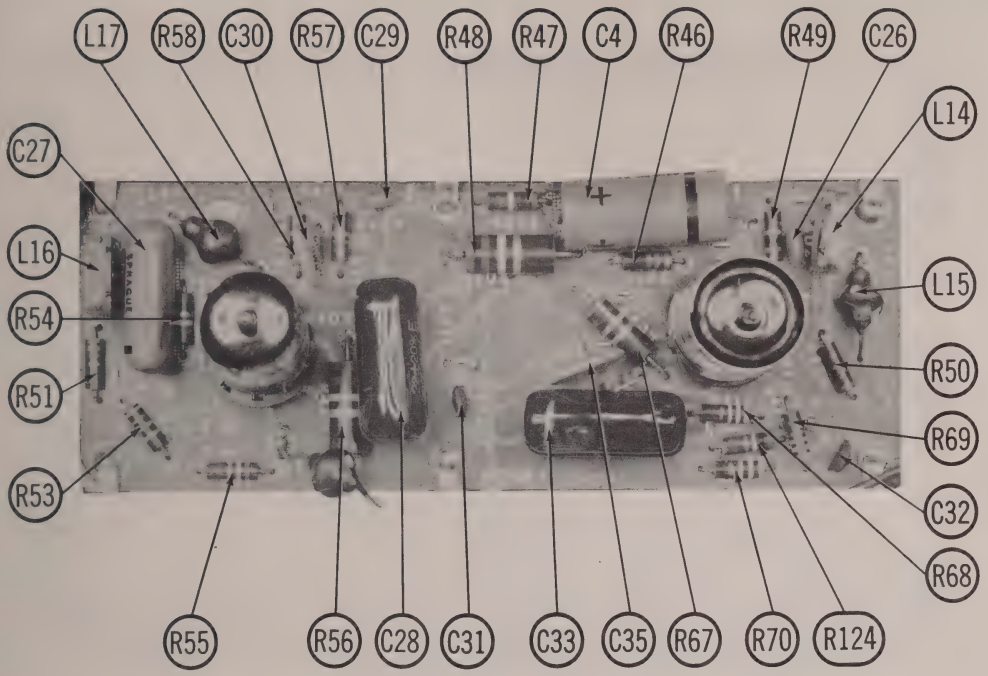
A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

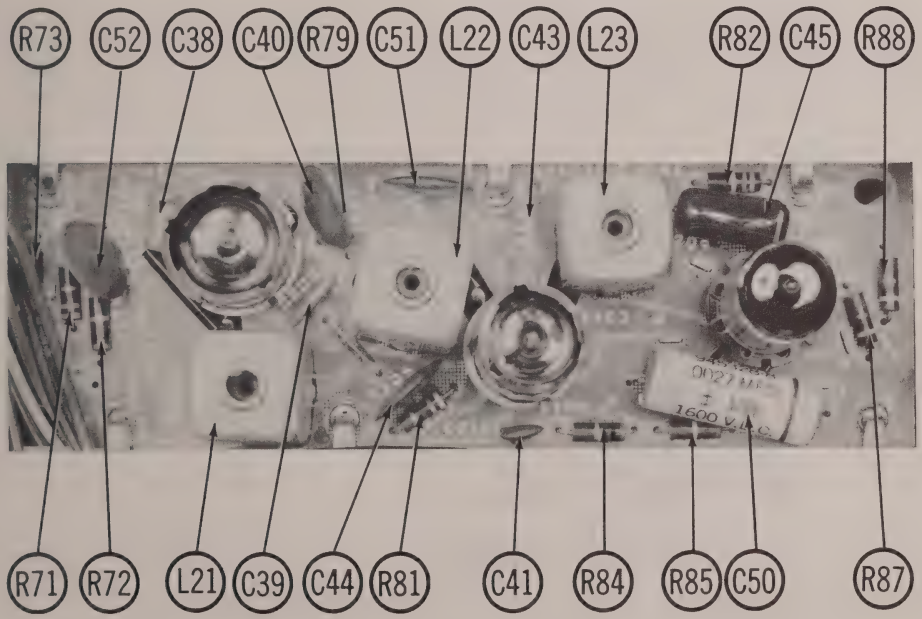
CircuiTrace Numbers 77 thru 102

A Howard W. Sams CIRCUITRACE® Photo

CONVERGENCE PRINTED BOARD

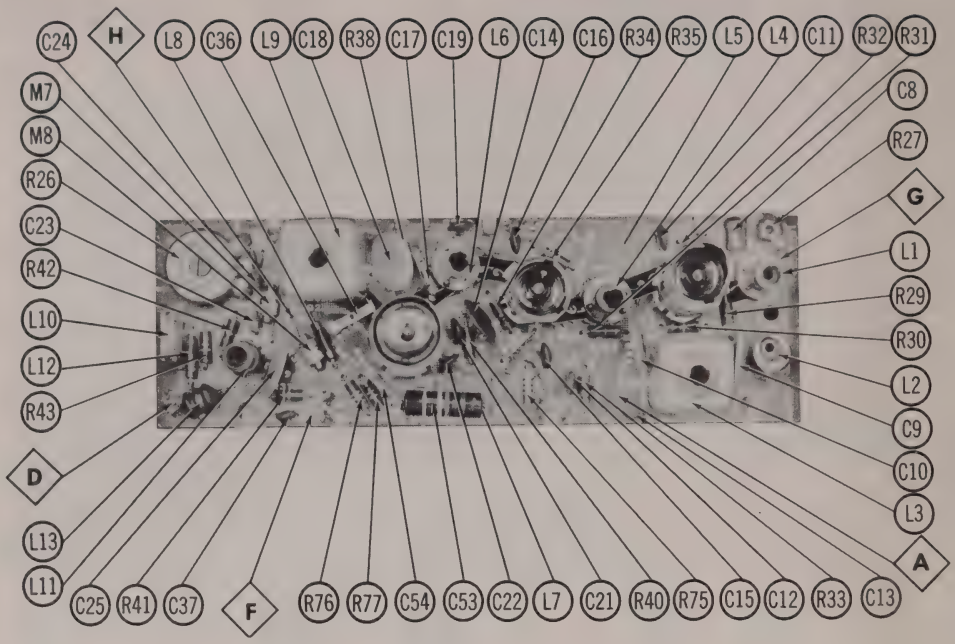


VIDEO PRINTED BOARD

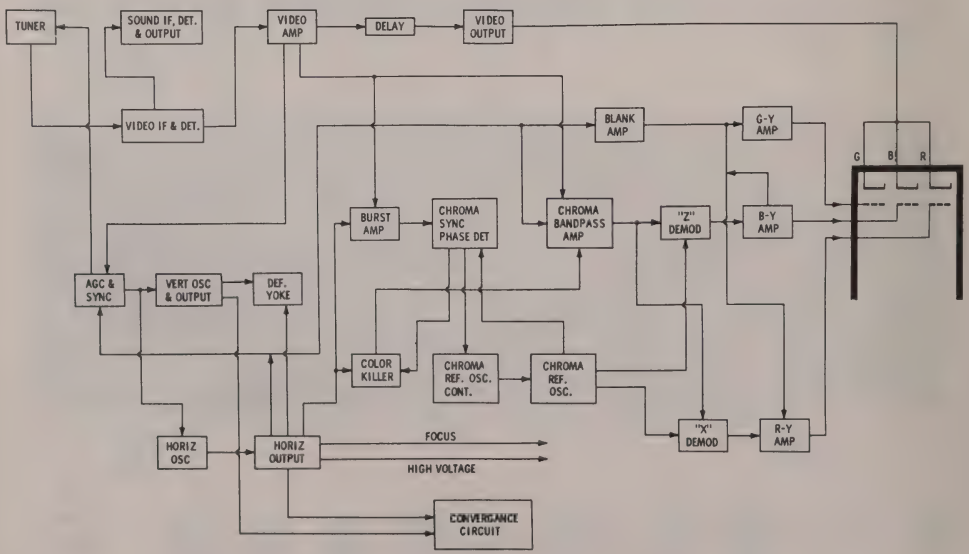


SOUND PRINTED BOARD

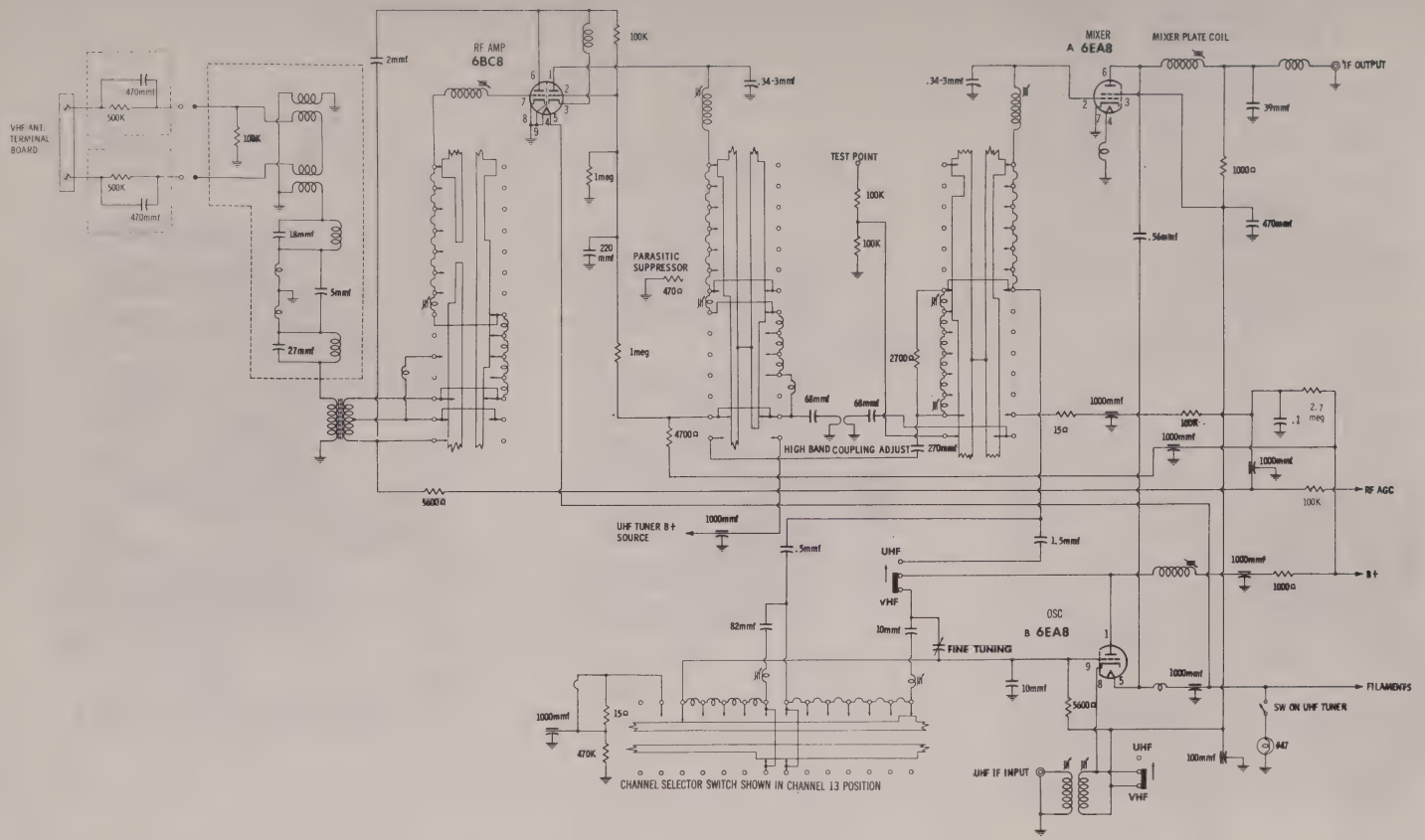
SET 495 FOLDER 1



VIDEO IF PRINTED BOARD



BLOCK DIAGRAM



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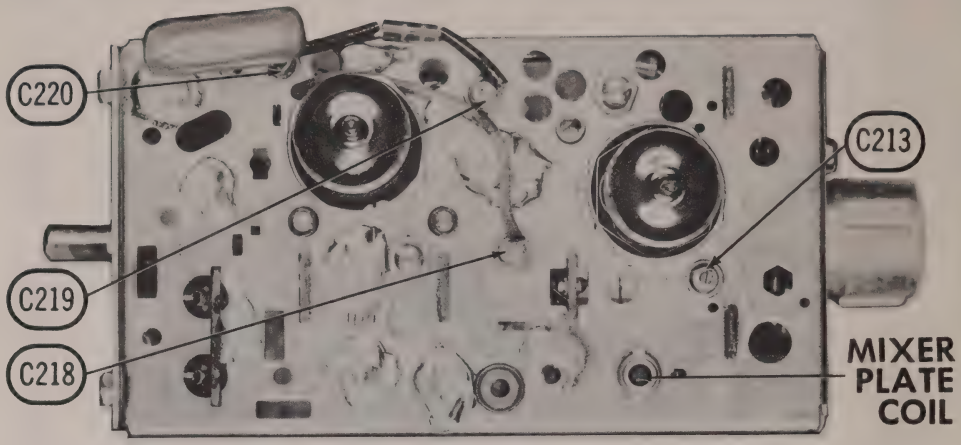
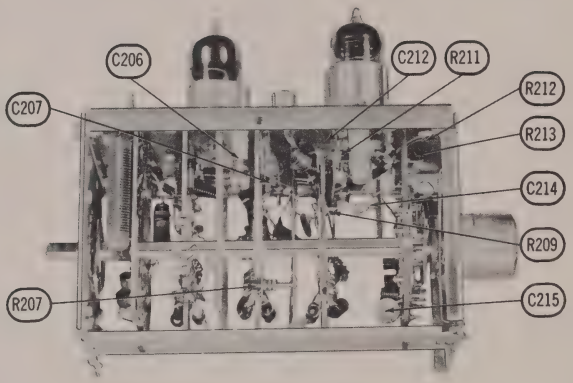
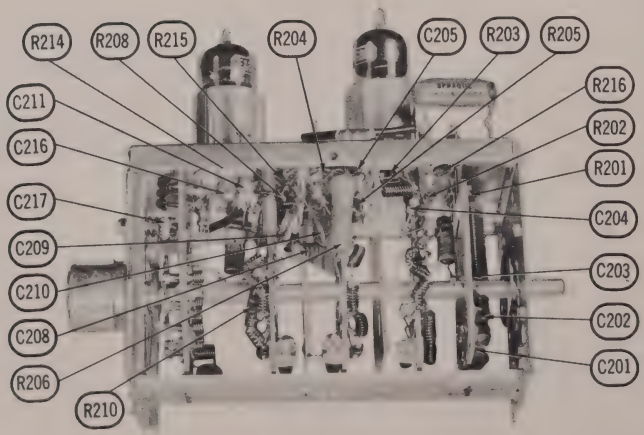
VHF TUNER WITH UHF PROVISIONS 94A181-2, 94A182-2

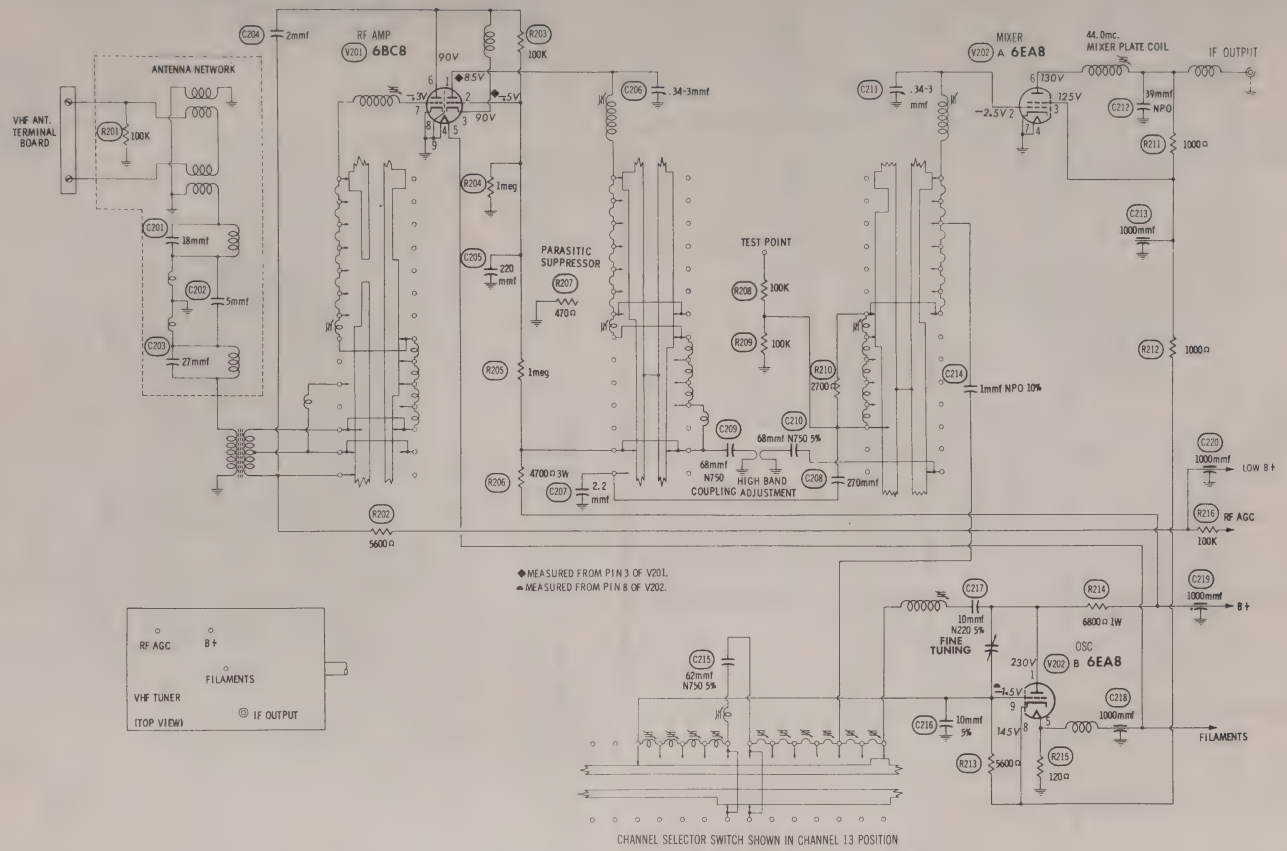
ADMIRAL CHASSIS 25A6, 25B6, 25UA6, 25UB6







TUNER 94A182-1



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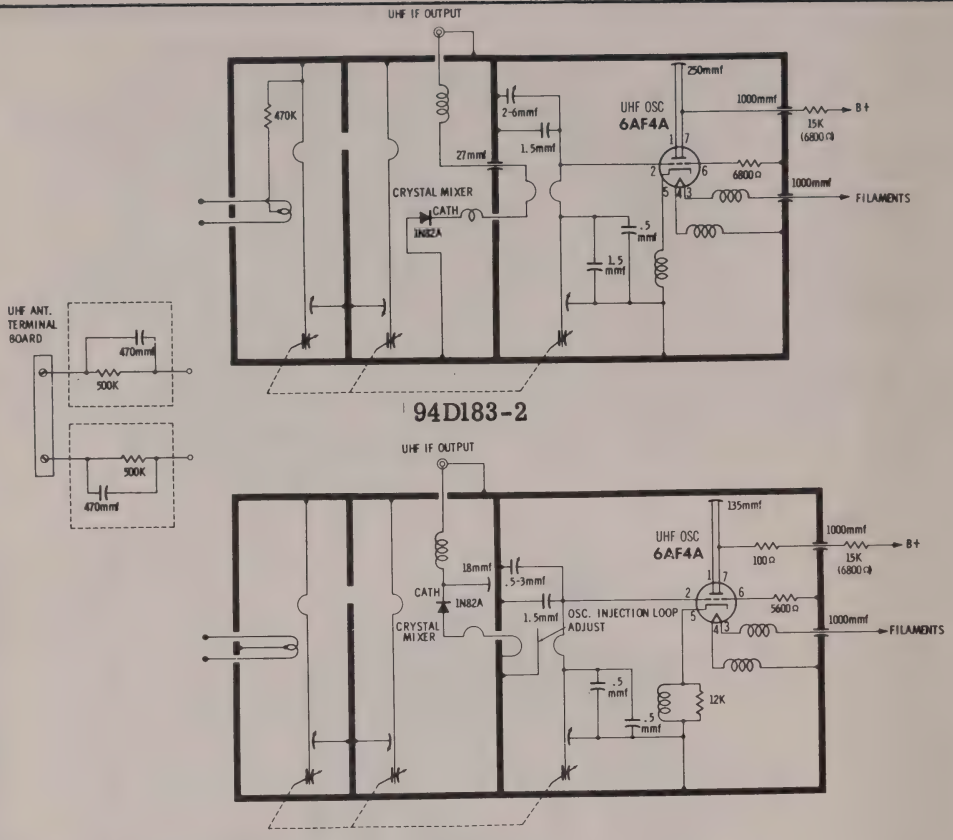
VHF TUNER 94A181-1, 94A182-1

ADMIRAL CHASSIS 25A6, 25B6, 25UA6, 25UB6



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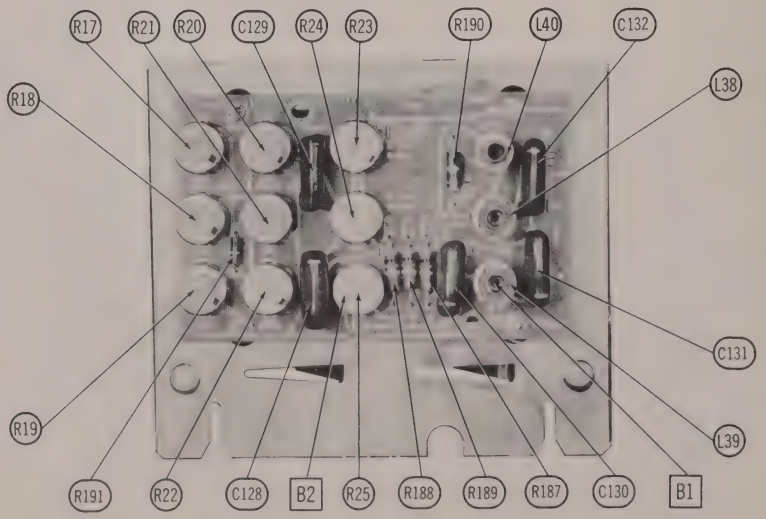
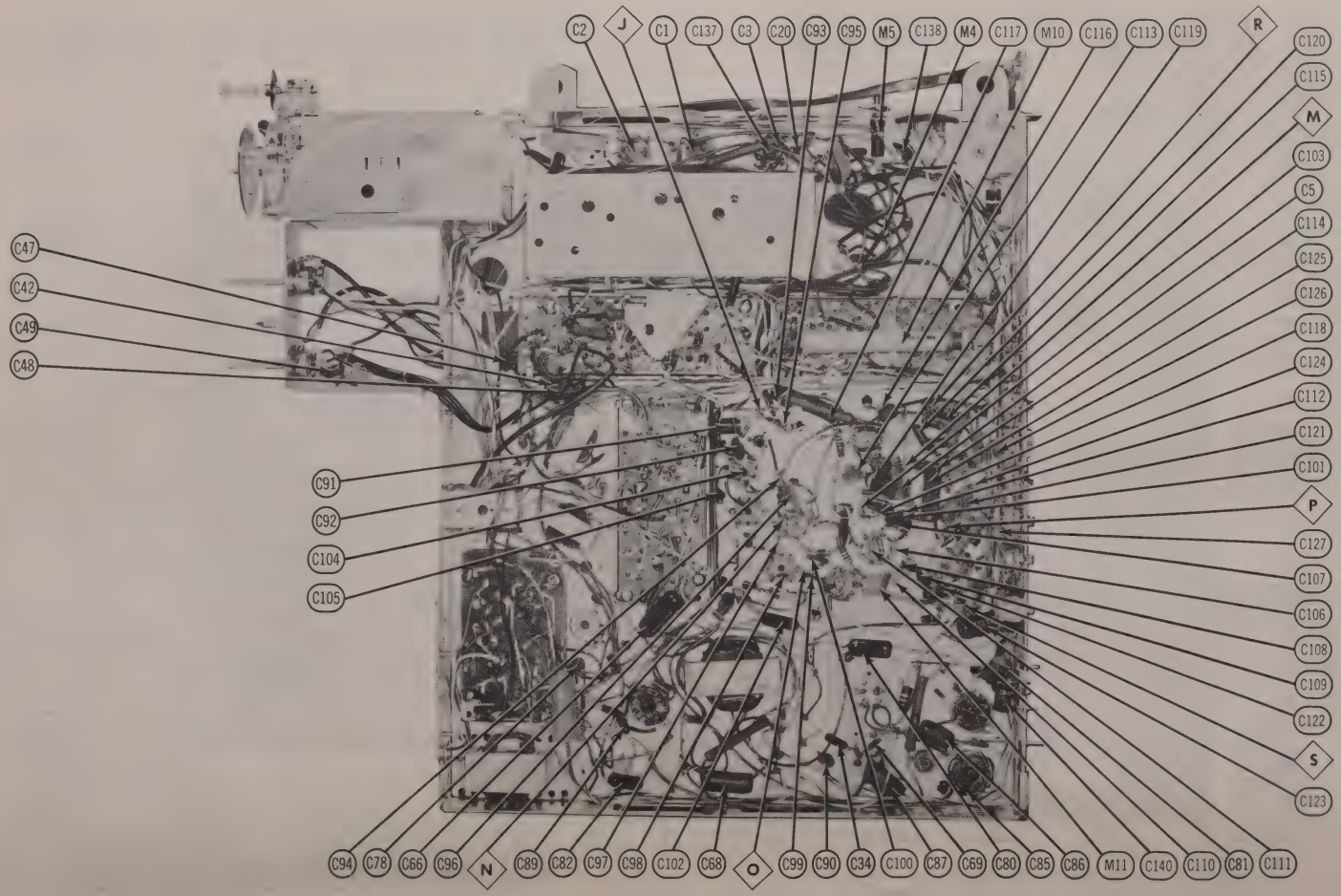
UHF TUNER

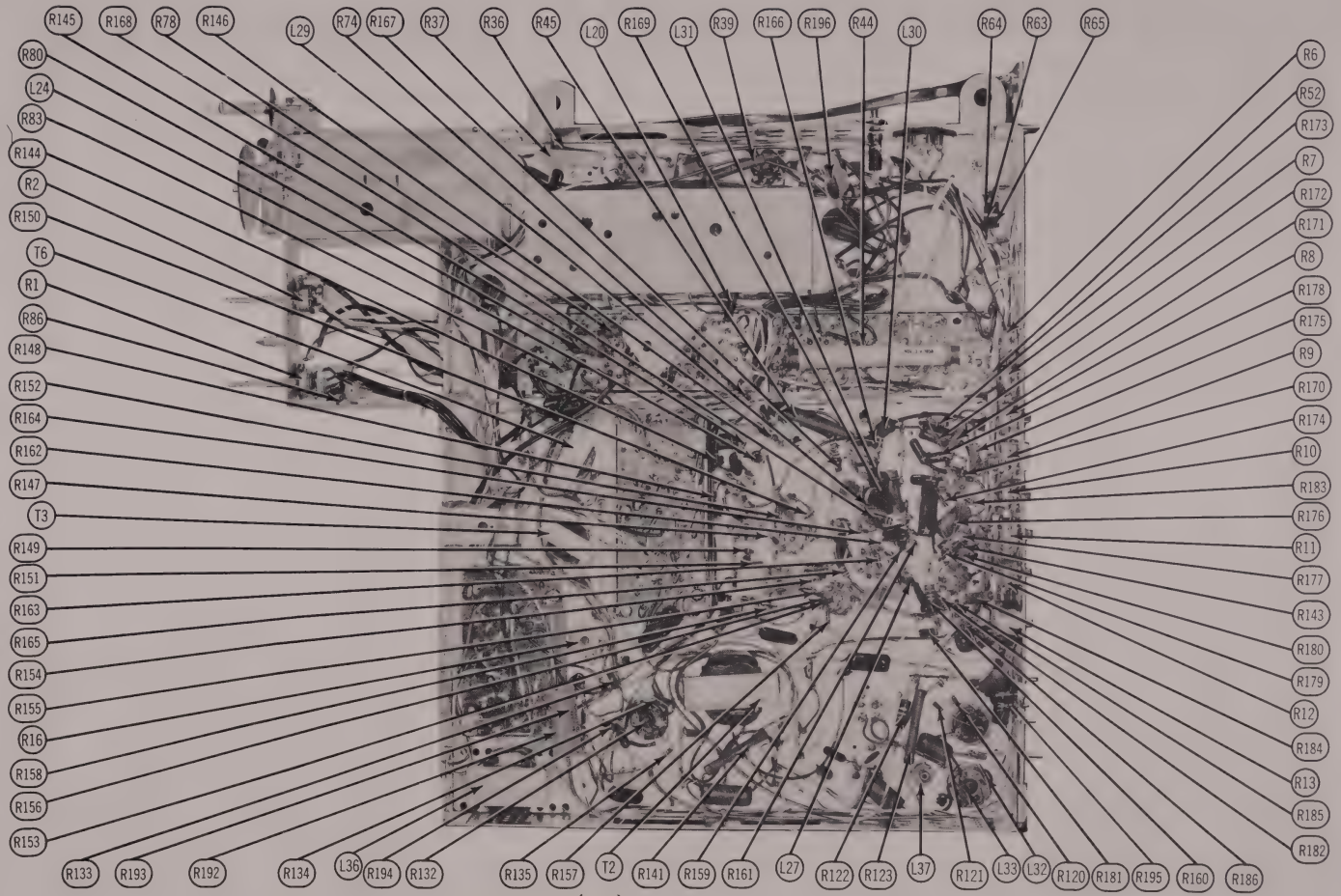


CONVERGENCE PRINTED BOARD

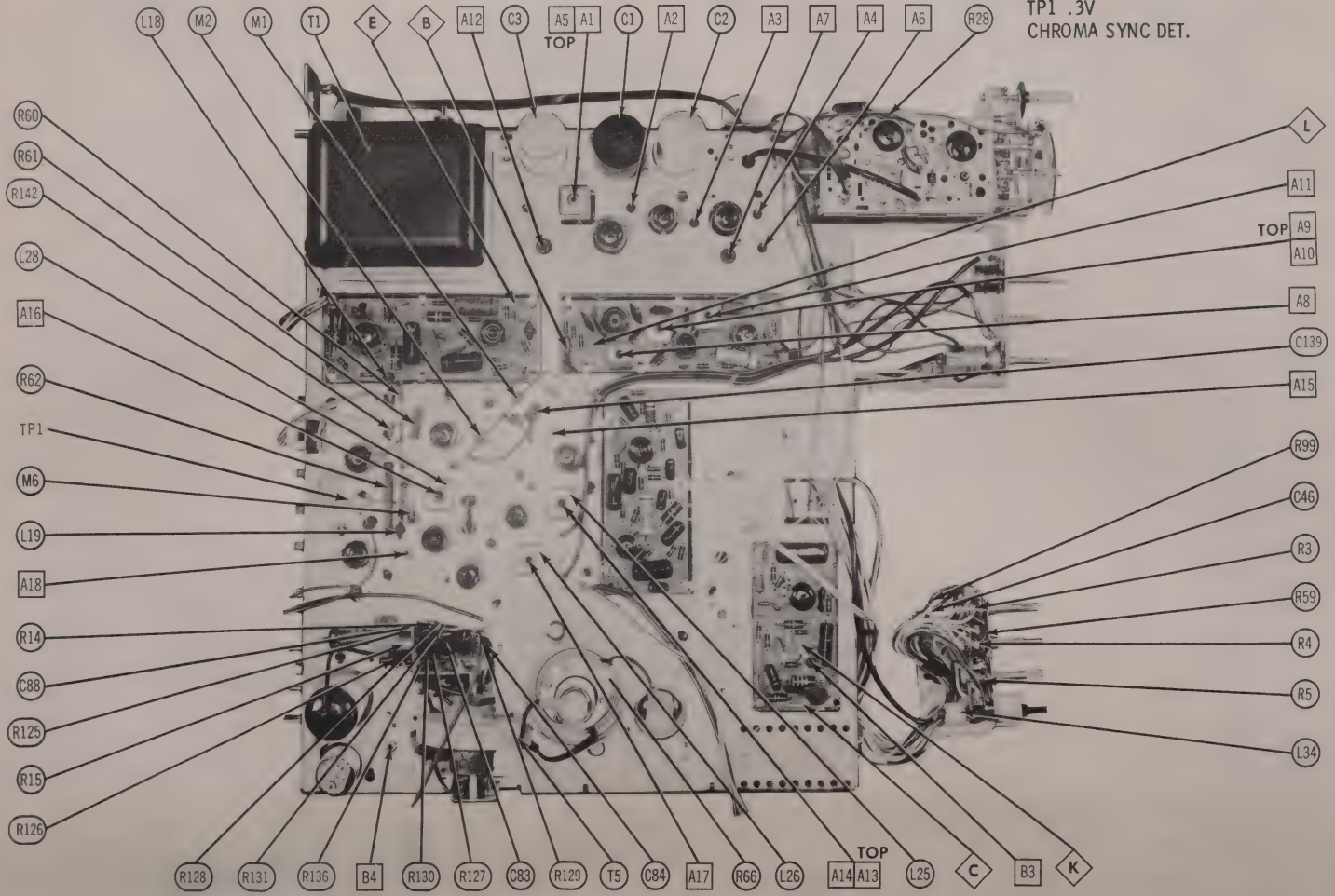
C70
R113
R112
R109
C73
C75
R116
R114
C76
R115
L35
C72
C71
R110
R119
R111
C79
R117
C77
C74
R118
HORIZONTAL PRINTED BOARD
R91
C55
R89
R90
R92
C56
R93
R94
C57
R96
R95
C58
R100
C59
R101
C62
C65
R108
R107
R105
C60
R98
C63
R103
C61
R102
R97
R106
R104
C67
C64
VERTICAL PRINTED BOARD



CHASSIS BOTTOM VIEW - CAPACITOR, MISC., & ALIGN. IDENT.



CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR, & TRANSFORMER IDENT.



CHASSIS - TOP VIEW

PHOTOFACT® Folder with CIRCUITRACE®

**ANDREA CHASSIS
VS323-1**

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ANDREA CHASSIS
VS323-1

MODEL WF2LB-VS323-1 (CH. VS323-1)

ANDREA CHASSIS
VS323-1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PHOTOFACT® Folder with CIRCUITRACE®

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL WF2LB-VS323-1

1. Remove 9 push-on type knobs in front of cabinet.
2. Remove 11 wood screws holding rear cover.
3. Remove rear cover.
4. Remove 4 screws holding tuner mounting bracket.
5. Remove tuner.
6. Remove 2 nuts holding control mounting bracket in front. Remove speaker leads.
7. Remove 4 chassis bolts from under cabinet and 2 wood screws holding picture tube mounting bracket.
8. Pull chassis straight out.

PICTURE TUBE REMOVAL

1. It is necessary to remove chassis for picture tube removal. (See "Chassis Removal".)
2. Remove picture tube socket, yoke, and high voltage lead.
3. Remove 3 metal screws holding picture tube mounting on each side and 2 metal screws in front.
4. Remove picture tube.

MODEL WF2LB-VS323-1) (CH. VS323-1)

TRADE NAME	ANDREA	MODELS	CHASSIS
		AW1LB-VS323-1, AW2LB-VS323-1, B1LB-VS323-1, E1LB-VS323-1, M1LB-VS323-1, M2LB-VS323-1, W1LB-VS323-1, W2LB-VS323-1, WF1LB-VS323-1, WF2LB-VS323-1	VS-323-1
MANUFACTURER	Andrea Radio Corp., 27-01 Bridge Plaza North, Long Island City, N. Y.		
TYPE SET	Television Receiver		
TUBES	VHF - Eighteen, UHF - Nineteen		
POWER SUPPLY	110-120 Volts AC, 50/60 Cycle	RATING 215 Watts, 1.9 Amp. @ 117 Volts AC, 60 Cycle	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

The safety glass is an integral part of the picture tube.

FUSE

A 1/4 Amp. slo-blo fuse is used for horizontal and vertical sweep output protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch up the VHF Oscillator, remove Channel Selector knob.

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Frequency slug. (For location, See B1 in photo "Chassis - Top View.")

WIDTH

The width may be varied by a Width coil. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive Control. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A9) located at top of chassis.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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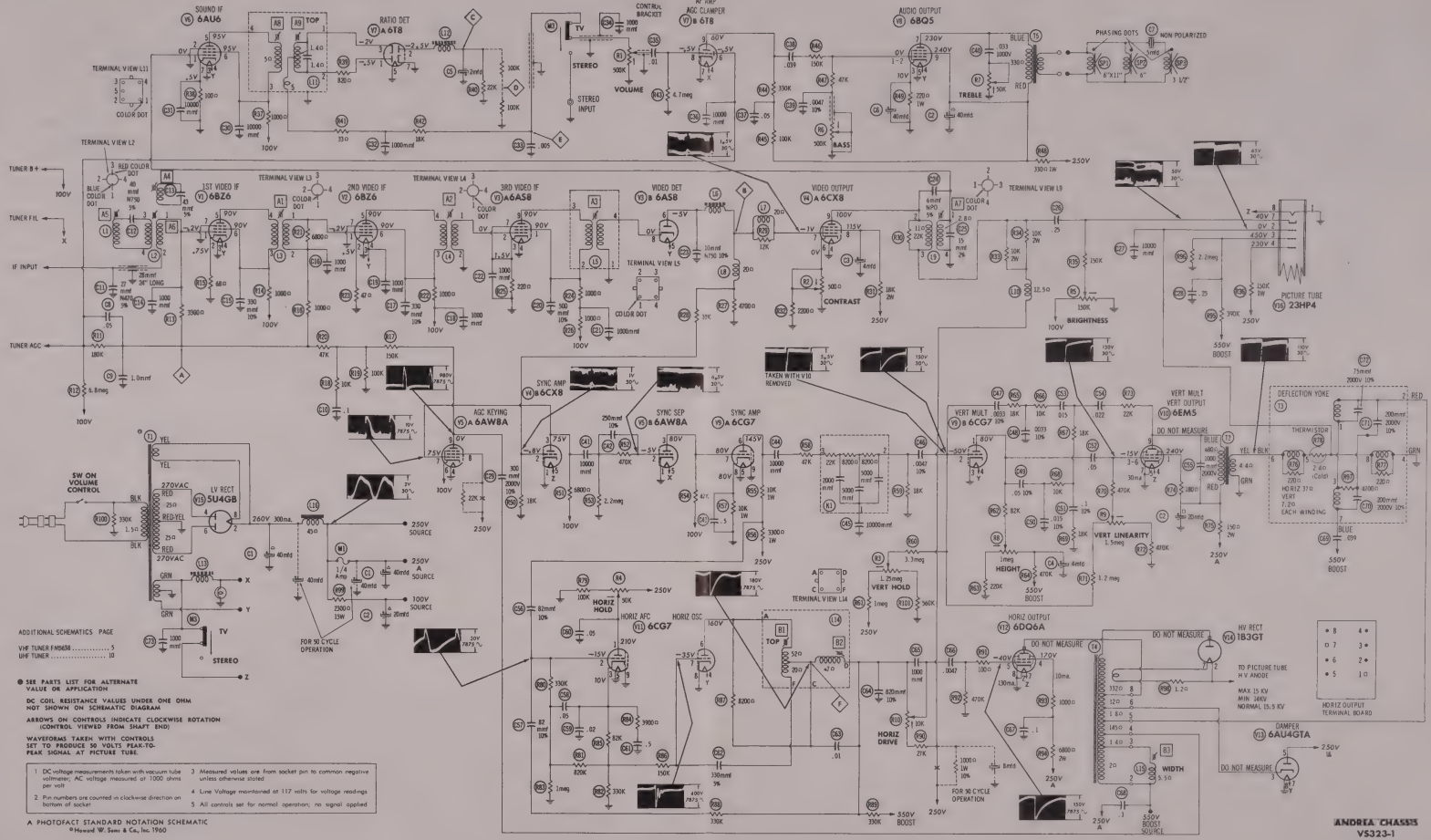
ANDREA CHASSIS
VS323-1

SET 495 FOLDER 2


SOUND IF V6 6AU6
RATIO DET V7 A 6T8
AF AMP AGC CLAMPER V7 B 6T8
AUDIO OUTPUT V8 6BQ5
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V10 6AS8
VIDEO DET V3 B 6AS8
VIDEO OUTPUT V4 A 6CX8
SYNC AMP V4 B 6CX8
AGC KEYING V5 A 6AW8A
SYNC SEP V5 B 6AW8A
SYNC AMP V9 A 6CG7
VERT MULT V7 B 6CG7
VERT MULT VERT OUTPUT V10 6EM5
HORIZ AFC V11 6CG7
HORIZ OSC
HORIZ OUTPUT V12 6DQ6A
HV RECT V14 1B3GT
DAMPER V13 6AU4GTA
LV RECT V15 5U4GB
TERMINAL VIEW L1
TERMINAL VIEW L2
TERMINAL VIEW L3
TERMINAL VIEW L4
TERMINAL VIEW L5
TERMINAL VIEW L9
TERMINAL VIEW L14
TUNER B+
TUNER FIL
IF INPUT
TUNER AGC
SW ON VOLUME CONTROL
270VAC
260V 300ma.
250V SOURCE
100V SOURCE
FOR 90 CYCLE OPERATION
STEREO
STEREO INPUT
VOLUME
TREBLE
BASS
CONTRAST
BRIGHTNESS
PICTURE TUBE 23HP4
PHASING DOTS
NON POLARIZED
TAKEN WITH VID REMOVED
VERT LINEARITY
HEIGHT
VERT HOLD
HORIZ HOLD
HORIZ DRIVE
WIDTH
DEFLECTION YOKE
THERMISTOR
DO NOT MEASURE
550V BOOST
ADDITIONAL SCHEMATICS PAGE
VHF TUNER FM6638 5
UHF TUNER 10
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 90 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation; no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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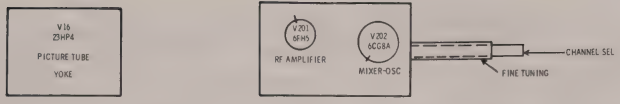
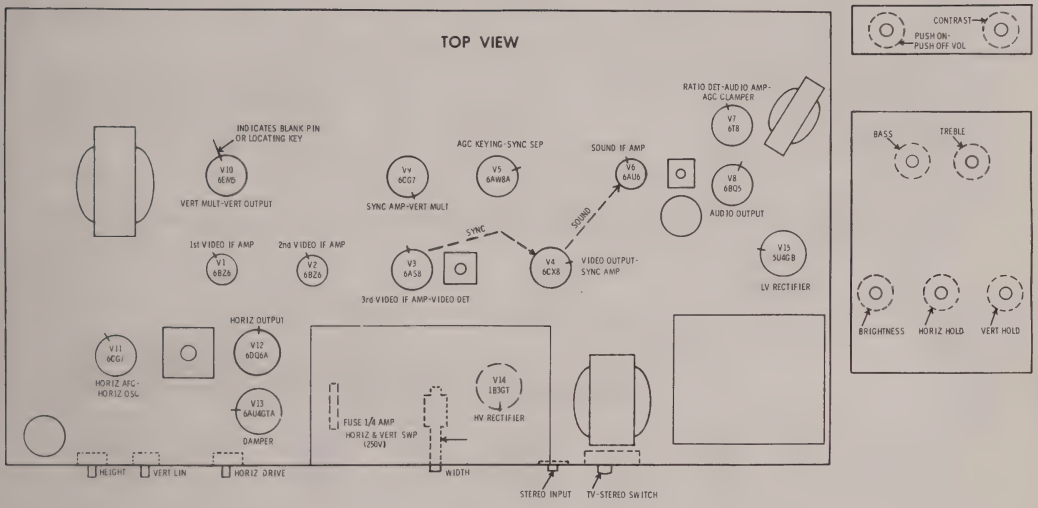
ANDREA CHASSIS VS323-1

TUBE PLACEMENT CHART





TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V15

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V16, Fuse (B+)
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15
Vert. off freq. V9, V10
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V16
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V4, V5, V9
No horiz. sync V4, V5, V9
No vert. or horiz. sync V4, V5, V9

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Place TV/Stereo Switch in "Stereo" position.
Suggested Alignment Tools: Al thru A9 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
Mixer Plate Coil ..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Disconnect IF Input coil from pin 1 (grid) of 1st Video IF Amp.
Attenuate Sweep Generator Output to maintain between 2 and 3 volts peak to peak on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .001mfd to pin 1 (grid) of 1st Video IF. Low side to chassis.	44.0MC (10MC Swp.)	41.25MC 42.5MC 43.0MC 45.0MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point (B). Low side to chassis. (Across Video Det. load).	A1, A2, A3	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls position of 45.75MC marker, A2 controls bandwidth and low frequency skirt of curve, and A3 controls tilt. Reconnect IF Input coil to grid of 1st Video IF.
2.	Place a thin insulated metal strip between the Mixer-Osc. tube and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	"	"	"	A4, A5, A6	Adjust A4 to place 41.25MC marker in trap notch. Adjust A5 to place 47.25MC marker in other trap notch. Adjust A6 and Mixer Plate coil for maximum flatness and position of 45.75MC marker as in Fig. 1. If necessary repeat steps 1 and 2.

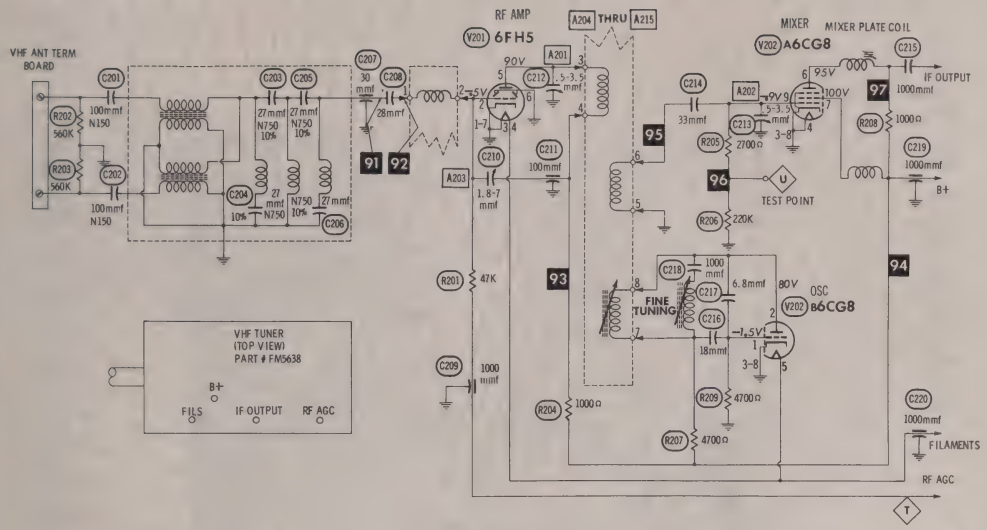
SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point (C) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	High side thru .01mfd to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point (C). Common to chassis.	A7, A8	Adjust for maximum deflection.
4.	"	"	"	DC probe to point (D). Common to point (E).	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FIG. 1

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 7



A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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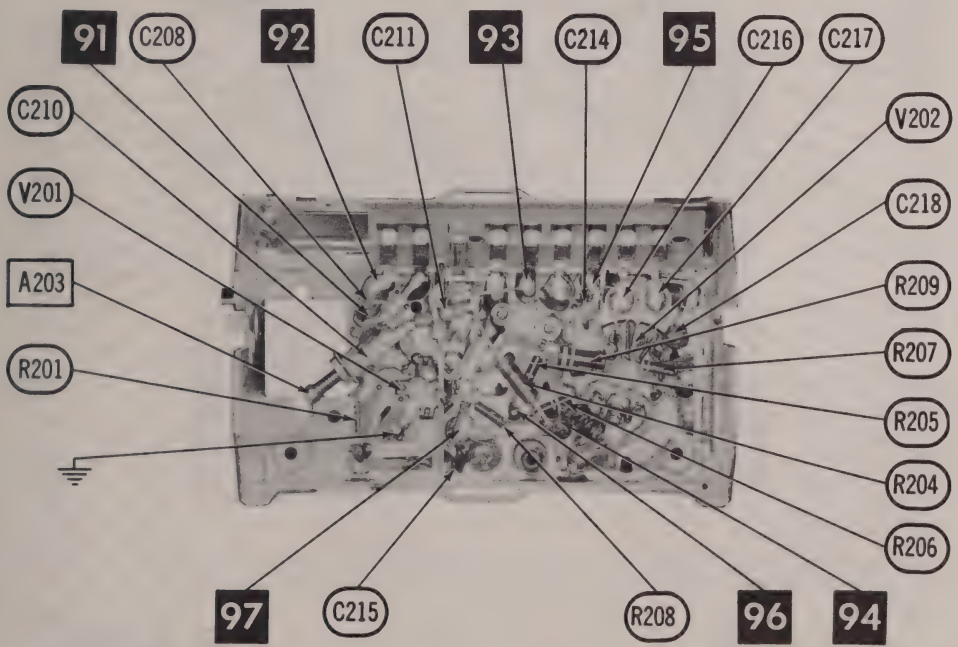
VHF TUNER FM5638

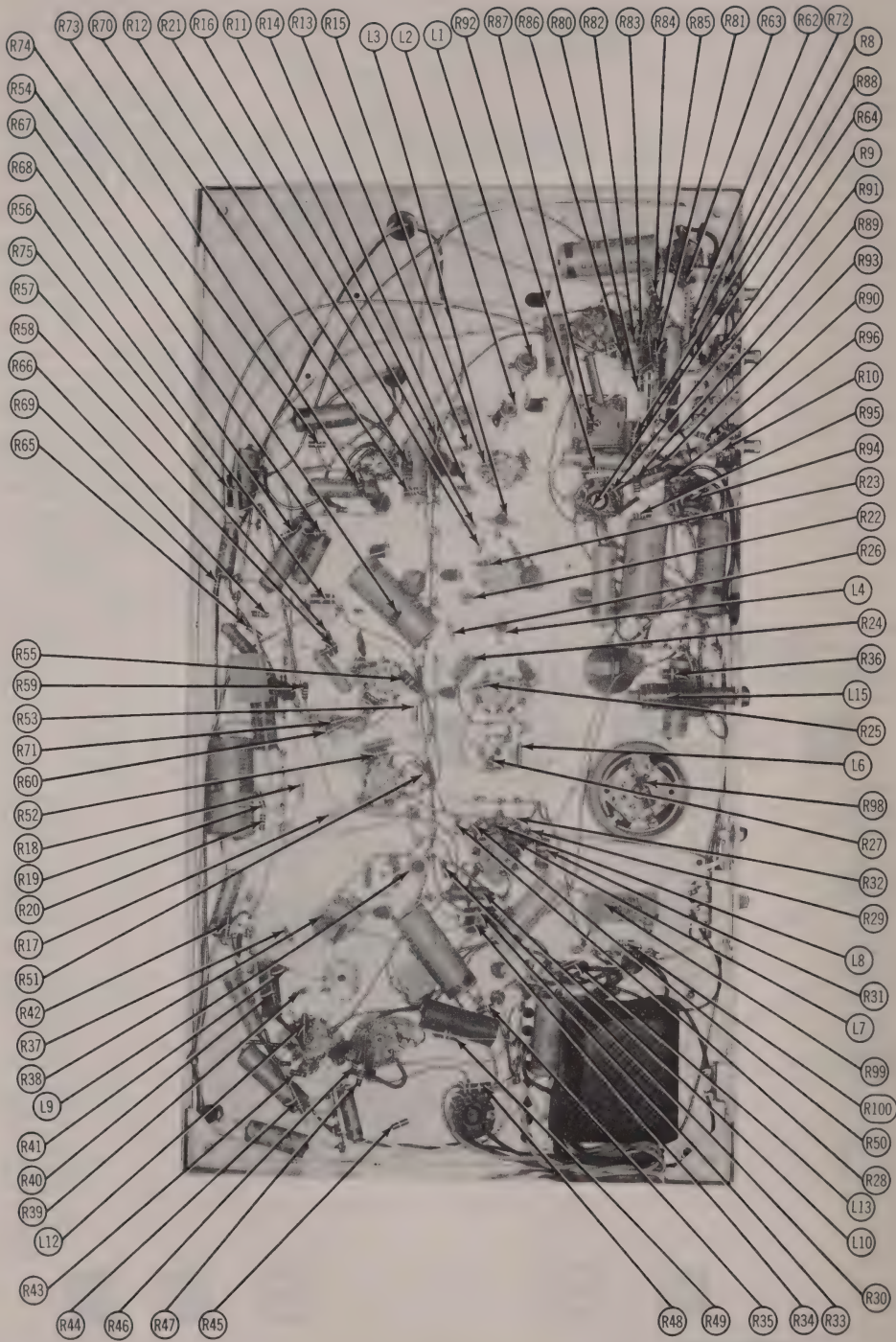


A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER FM5638 - BOTTOM VIEW

SET 495 FOLDER 2



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 ..... GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A204 thru A215 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

RF AND MIXER ALIGNMENT

Connect the negative lead of a 4 volt bias supply to point Ⓣ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Turn Contrast fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. to point Ⓓ Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 201. If markers fall below 70% on any channel, make compromise adjustment of A201 and A202 with channel switch set to that channel. Check to see that other channels have not been seriously affected.
			207MC	205.25MC 209.75MC	12			
			201MC	199.25MC 203.75MC	11			
			195MC	193.25MC 197.75MC	10			
			189MC	187.25MC 191.75MC	9			
			183MC	181.25MC 185.75MC	8			
			177MC	175.25MC 179.75MC	7			
			85MC	83.25MC 87.75MC	6			
			79MC	77.25MC 81.75MC	5			
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			

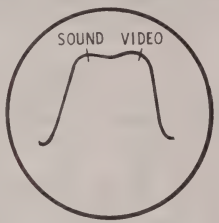


FIG. 201

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K across Video Det. load.	A204	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

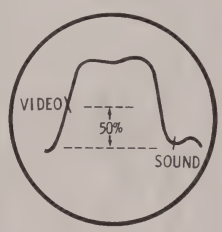


FIG. 202

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS — GENERAL ELECTRIC — USE	TYPE
V1	1st Video IF Amp.	6BZ6
V2	2nd Video IF Amp.	6BZ6
V3	3rd Video IF Amp.- Video Det.	6AS8
V4	Video Output - Sync Amp.	6CX8
V5	AGC Keying - Sync Sep.	6AW8A
V6	Sound IF Amplifier	6AU8
V7	Ratio Det. - AGC Clamper- Audio Amp.	6T8

ITEM No.	RAYTHEON — SYLVANIA — USE	TYPE
V8	Audio Output	6BQ6
V9	Sync Amp. - Vert. Mult.	6CG7
V10	Vert. Mult. - Vert. Output	6EM5
V11	Horiz. AFC - Horiz. Osc.	6CG7
V12	Horiz. Output	6DQ6A
V13	Damper	6AU4GTA
V14	HV Rectifier	1B3GT
V15	LV Rectifier	5U4GB

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: ANDREA Part No.	GENERAL ELECTRIC Part No.	RCA Part No.	RAYTHEON Part No.	SYLVANIA Part No.	NOTES
V16	23EP4					

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	REPLACEMENT DATA: ANDREA Part No.	AEROVOX Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SPRAGUE Part No.	NOTES
C1A	40	450	HCE-1340	AFH2-57	BO450	FP238	TMD-54	TVL-2764	
B	40	450							
C1A	20	450	HCE-1361	AFH3-50-06	C0372	FP396.1	TMT-37	TVL-3815.6	
B	40	450							
C	20	450							
C3	4	450	HCE-1354	PR8T10	BR445	TC70	TD-4-450	TVA-1702	
C4	4	450	HCE-1354	PR8450V4	BR445	TC70	TD-4-450	TVA-1702	
C5	3	100	HCE-1367	PR8T05	BR345	TC595	TD-2-450	TVA-1701	
C6	40	25	HCE-1368	PR8T20	BR4018	TC42	TD-40-150	TVA-1412	
C7	5	10NP	HCE-1343	PR86300	BBR4-150	TCN105		TVANS-1110 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ELMENCO Part No.	MALLORY Part No.	SPRAGUE Part No.
C1	.05	600V		P488N-05		DD-503	CUB4S4	4DP-3-503	GEM-415	47M-S5
C2	1.0	100V		P388N-1.0			CUB2W1		GEM-31	27M-M1
C10	.01	200V		P388N-1		DF-104	CUB2F1	2DP-3-104	GEM-301	27M-F1
C11	27	9410	5%		#ECC-1989			*		
C12	40	N750	5%				TCN-39	C10Q39U	CN7-439	10TCC-Q39
C13	43		5%		1469-000043		TCZ-43	22R5Q43	CM-19B-430J	MS-443
C14	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	330		10%		DF-330	DD-331	BYA10D1	CCD-331	GP330	10TS-T33
C16	1000		10%		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	330		10%		DH-330	DD-331	LUT33	CCD-331	GP330	10TS-T33
C18	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C19	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C20	500		10%		1469-0005		BYA10D1	CCD-102	B-210	5HK-D10
C21	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C22	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C23	10	N750	10%		N750-DI 10	DTN-10	CUQ1G1	CCN-100	CN7-410	10TCC-Q10
C24	6	NPO	5%	#ECC-1992			C10Y6C	*		
C25	15		5%	#ECC-1981						
C26	.25	400V			P488N-25		CUB4P25	4DP-5-254	GEM-4025	47M-P25
C27	10000				BPD-001	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	.25	600V			P688N-25		6DP-5-254	GEM-6025	67M-P25	
C29	300	2000V	10%	#ECM-1616C33				VCM-35-301K		
C30	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C32	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C33	.005	600V			P668N-005	DD-502	CUB5D5	6DP-1-502	GEM-625	67M-D5
C34	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-110	5HK-D10
C35	.01	600V			P668N-01	DE-103	CUB6S1	6DP-3-103	GEM-611	67M-S1
C36	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	.05	400V			P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	47M-S5
C38	.039	600V			P684CM-039	DD-403	CUB6S4	6DP-3-393	GEM-614	67M-S4
C39	.0047	400V	10%		V84C4D47-10%			PM6D47	6DP-1-472	JL-472
C40	.033	1000V			P108N-033			CUB1D33	16DP-4-333	GEM-10133
C41	1000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C42	250		10%		1469-00025	D6-251		22R5T25	CM-19B-251K	MCB240
C43	.5	200V	10%		P288N-5			CUB2P5	2DP-5-504	GEM-305
C44	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C46	.0047	400V	10%		V84C4D47-10%			PM6D47	6DP-1-472	JL-347
C47	.0033	400V	10%		V84C4D33-10%			PM6D33	6DP-1-332	JL-333
C48	.0033	400V	10%		V84C4D33-10%			PM6D33	6DP-1-332	JL-333
C49	.047	400V	10%		V84C4S5-10%			PM4M5	4DP-3-503	GEM-1615
C50	.015	400V	10%		V84C4S1-10%			PM4M1	4DP-1-153	
C51	.1	200V			V84C4P1-10%			PM4P1	4DP-3-104	
C52	.05	400V			P488N-05	DD-503		CUB4S5	4DP-3-503	GEM-415
C53	.015	400V			P488N-015	DD-153		CUB4S15	4DP-1-153	GEM-4115
C54	.022	600V			P688N-022	DD-203		CUB6S22	6DP-3-223	GEM-6223
C55	1000	2000V			HVD-30-1000	DD30-102		HVB20D1	3CCD-102	3HV-S10
C56	82		10%		1469-000082	TCZ-82		22R5Q82	CM-19B-820K	CNO-482
C57	82		10%		1469-000082	TCZ-82		22R5Q82	CM-19B-820K	CNO-482
C58	.05	400V			P488N-05	DD-503		CUB4S5	4DP-3-503	GEM-415
C59	.02	600V			P668N-02	DD-203		CUB6S2	6DP-3-203	GEM-612
C60	.05	400V			P488N-05	DD-503		CUB4S5	4DP-3-503	GEM-415
C61	.2	200V			P288N-5			CUB2P5	2DP-5-504	GEM-305
C62	330		5%		1469-00033			22R5Q33	CM-19D-331J	MS-333
C63	.01	600V			P668N-01	DE-103		CUB6S1	6DP-3-103	GEM-611
C64	820		10%		1469-00082			1R5T82	CM-19B-821K	MCB281
C65	1000				BPD-001	DD-102		BYA10S1	CCD-103	B-210
C66	.0047	600V			P668N-0047	D6-472		CUB6D47	6DP-1-472	GEM-6247
C67	.1	600V			P668N-1	DF-104		CUB6P1	6DP-4-104	GEM-601
C68	.1	400V			P488N-1	DF-104		CUB4P1	6DP-4-104	GEM-401
C69	330	600V			P684CM-039	DD-403		CUB6S4	6DP-3-393	GEM-614
C70	200	2000V	10%	#ECC-1991					VCM-20-201K	
C71	200	2000V	10%	#ECC-1991					VCM-20-201K	

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ELMENCO Part No.	MALLORY Part No.	SPRAGUE Part No.
C72	75	2000V	10%				HVA20Q75	VCM-20-750K		
C73	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

* Andrea Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: ANDREA Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	CTS-IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	500K	½	GRV-869		B47-500K-Z	B13-133	PP55A	Volume
B	Shaft				*	SK7 a	DS-26	
C	Switch				Not Req.	Not Req.	Not Req.	Push-Push, Off-On
R2	500Ω	½	GRV-870-1	B-415		Q17-105 †		Contrast
R3A	1. 5Smeg	½	GRV-846-1	B-743	A47-1.5meg-S	Q11-138	U155	Vert. Hold
B	Shaft			Not Req.	KSB-3	Not Req.	Not Req.	
R4A	50K	½	GRV-847-1	B-21	A47-50K-S	Q11-132	U35	Horiz. Hold
B	Shaft			Not Req.	KSB-3	Not Req.	Not Req.	
R5A	150K	½	GRV-877	B-43	A47-150K-S	Q11-328	RU154L	Brightness
B	Shaft			Not Req.	KSB-3	SL3500 †	SL3500 †	
R6A	500K	½	GRV-889	B-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			Not Req.	KSB-3	Not Req.	Not Req.	
R7A	50K	½	GRV-888	B-32	A47-50K-Z	Q13-132	U33	Treble
B	Shaft			Not Req.	KSB-3	Not Req.	Not Req.	
R8A	1meg	½	GRV-886	AB-69	B47-1meg-S	B11-137	TA16L	Height
B	Shaft			AK-1	Not Req.	TM4	Not Req.	
R9A	1. 5meg	½	GRV-861	AB-743	B47-1.5meg-S	B11-136	TA155L	Vert. Linearity
B	Shaft			AK-1	Not Req.	TM4	Not Req.	
R10A	10K	½	GRV-876	AB-14	B47-10K-S	B11-116	TA14L	Horiz. Drive
B	Shaft			AK-1	Not Req.	TM4	Not Req.	

* Use coupler #C3.
* Use shaft coupler and extension shaft.
† Use Bushing #SL-38.
† Use AC6 shaft.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R11	180K	
R12	6. 8meg	
R13	3300Ω	
R14	1000Ω	
R15	68Ω	
R16	1000Ω	
R17	150K	
R18	10K	
R19	100K	
R20	47Ω	
R21	6800Ω	
R22	1000Ω	
R23	47Ω	
R24	1000Ω	
R25	220Ω	
R26	1000Ω	
R27	4700Ω	
R28	10K	
R29	12K	
R30	22K	
R31	18K 2W	
R32	2200Ω	
R33	10K 2W	
R34	10K 2W	
R35	150K	
R36	150K 1W	
R37	1000Ω	
R38	100Ω	
R39	820Ω	
R40	22K	
R41	33Ω	

ITEM No.	RATING	REMARKS
R42	18K	
R43	4. 7meg	
R44	330K	
R45	100K	
R46	150K	
R47	47K	
R48	330Ω 1W	
R49	220Ω 1W	
R50	18K	
R51	6800Ω	
R52	470K	
R53	2. 2meg	
R54	47K	
R55	10K 1W	
R56	3300Ω 1W	
R57	10K 1W	
R58	47K	
R59	18K	
R60	3. 3meg	
R61	1meg	
R62	82K	
R63	220K	
R64	470K	
R65	18K	
R66	10K	
R67	18K	
R68	10K	
R69	18K	
R70	470K	
R71	1. 2meg	
R72	470K	

ITEM No.	RATING	REMARKS
R73	22K	
R74	180Ω	
R75	1500 2W	
R76	220Ω	
R77	220Ω	
R78	2. 4Ω (Cold)	
R79	100K	
R80	330K	
R81	820K	
R82	330K	
R83	1meg	
R84	3900Ω	
R85	82K	
R86	150K	
R87	8200Ω	
R88	330K	
R89	330K	
R90	27K	
R91	100Ω	
R92	470K	
R93	1000Ω	
R94	6800Ω 2W	
R95	390K	
R96	2. 2meg	
R97	4700Ω	
R98	1. 2Ω	
R99	2300Ω 15W	#GRW-568
R100	330K	
R101	560K	

\# Andrea Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ANDREA Part No.	Gramer Part No.	Meissner Part No.	Merit Part No.	Miller Part No.	Ram Part No.	NOTES
L1	47.25MC Trap	SA-381	20-1049	20-1049	TV-153	6225		
L2A	1st Video IF	SA-377C	17-4535	17-4535		6221		
B	2. 25MC Trap		*	*				
L3	2nd Video IF	SA-378	17-4523	17-4523	TV-130	6219	VF-3	
L4	3rd Video IF	SA-379	17-4523	17-4523	TV-130	6219	VF-3	
L5	4th Video IF	SA-380	17-5004	17-5004	TV-136	6334		
L6	Resonant Choke	SA-420						
L7	Series Peaking Coil	SA-433	19-4400	19-4400	TV-202	6136	VP-8	12. 5uh
L8	Shunt Peaking Coil	SA-432	19-4400	19-4400	TV-203	6136	VP-8	440uh
L9A	Series Peaking Coil	SA-434	19-3275	19-3275	TV-196	6130	VP-6	280uh
B	Sound Takeoff							
L10	Shunt Peaking Coil	SA-364	19-3250	19-3250	TV-196	6130	VP-5	270uh
L11	Ratio Det.	SA-422	17-3497	17-3497	TV-115	6205	SD-4	
L12	Resonant Choke	SA-430						12. 5uh
L13	Fil. Choke	SA-416	19-1003	19-1003	BC-563	4606		2uh

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ANDREA Part No.	Halldorson Part No.	Merit Part No.	Miller Part No.	Ram Part No.	Thorderson Part No.	NOTES
L14A	72Ω		SA-355-1		TV-162	6183	H-100		Horiz. Osc., Tap @ 20Ω
B	47Ω				*	*			Horiz. Waveform

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ANDREA Part No.	Halldorson Part No.	Merit Part No.	Miller Part No.	Ram Part No.	Rogers Part No.	Stancor Part No.	Thordorson Part No.	Triad Part No.
L15	Width Coil 1. 8MH-10MH	SA-418	WC-32 ①	MWC-6	6522	20UR15 ①	QRC108	WC-8A	WC-32 ①	WLC-5

① Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (5) CURRENT 1000 (~)	REPLACEMENT DATA: ANDREA Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordorson Part No.	Triad Part No.
L16	.300A	46Ω	1. 7 Hy.	ST-3107	26C44	C-2996 ①	Y-801 ①	C-2326 ①	26C44	C-28X

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: ANDREA Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordorson Part No.	Triad Part No.
T1	117V @ 1. 8A	540VCT @ .300A	5V @ 3A	ST-3106 ①						R-80BA
	SEC. 3	SEC. 4	SEC. 5							
	12. 6VCT @ 5A									

① 60 Cycle Operation (50 Cycle Transformer Available).

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ANDREA Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Rogers Part No.	Stancor Part No.	Thordorson Part No.	Triad Part No.
T2	Vert. Output	ST-3106							A-113X ①
T3	Yoke (Horiz., 19MH) (110) (Vert., 13.8MH) Rear Cover and Centering Device	ST-3096	Y-52 ③		Y-110 ②		DY-27A ①	Y-52 ①	Y-60 ①
									YC-110
T4	Horiz. Output	ST-3095-2	FLY-150 *	HVO-81 *	X167 *	EFRIT2*③	HO289 *	FLY-150 *	D-160 *④

① Use original yoke damping network.
② Use original yoke damping network, rear cover, and centering device.
③ Drill new mounting hole(s). Remove one turn from filament winding.
④ For insufficient sweep connect approximate 100mmf @ 4KV across terminals #1 and #3.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

Connect Width Coil Across	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram-Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
	8	3	9	5	5	5	5	8
	6	4	7	4	4	4	4	4
	5	3	5	3	3	3	3	3
	4	2	3	2	2	2	2	6
	3	2	3	2	2	2	2	2
	2	1	1	1	1	1	1	1
3 & 2		2 & 1	3 & 1	2 & 1	2 & 1	2 & 1	2 & 1	2 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: ANDREA Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Thordorson Part No.	Triad Part No.	NOTES
T5	4800Ω	3-4Ω	ST-3104	26949	A-3019	AU-804	A-8092	26949	S-52

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: ANDREA Part No.	QUAM Part No.	NOTES
SP1	6½" x 11"	PM	6-8Ω	SL-4041		
SP2	6½"	PM	6-8Ω	SL-4042	8AZ6Z6.5	
SP3	3½"	PM	6-8Ω	SL-4043	3AH5Z6.5	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ANDREA Part No.	REPLACEMENT DATA
K1	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 82000, 82000, 22K	FM-5289	Aerovox PA-110 Centralab 1171M1 Corsell Dubilier 1171M1 Mallory SER-100 Sprague V-1/V-3

ANDREA CHASSIS VS323-1

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ANDREA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1/4A 250V S/B	FM-5542	FM-5543	313.250 (3AG 1/4A 250V S/B)	357001	MDL 1/4	4408

MISCELLANEOUS

ITEM No.	PART NAME	ANDREA PART No.	NOTES
M2	Tuner	FM-5638	VHF, STANDARD COIL Replacement Type #GG-4220/A
M3	Tuner	FM-5637	TV-Stereo (Slide Type DPDT)

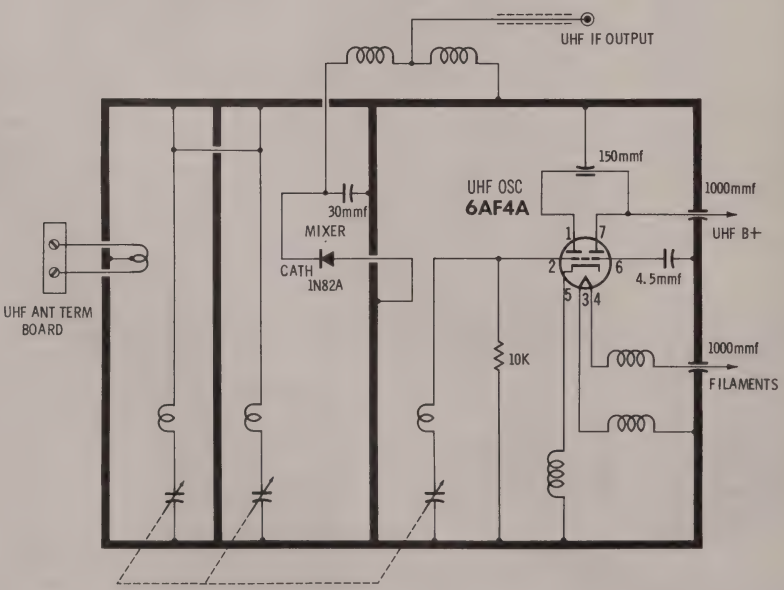
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Mask	EP-1078	Gray or Gold
Knob	FM-5640	Channel Selector
Knob	FM-5547G	Fine Tuning, Volume, Contrast
Knob	FM-5550G	Brightness, Vertical Hold, Horizontal Hold
Knob	FM-5478G	Bass, Treble
Channel Scale	S-148	VHF, Assembled

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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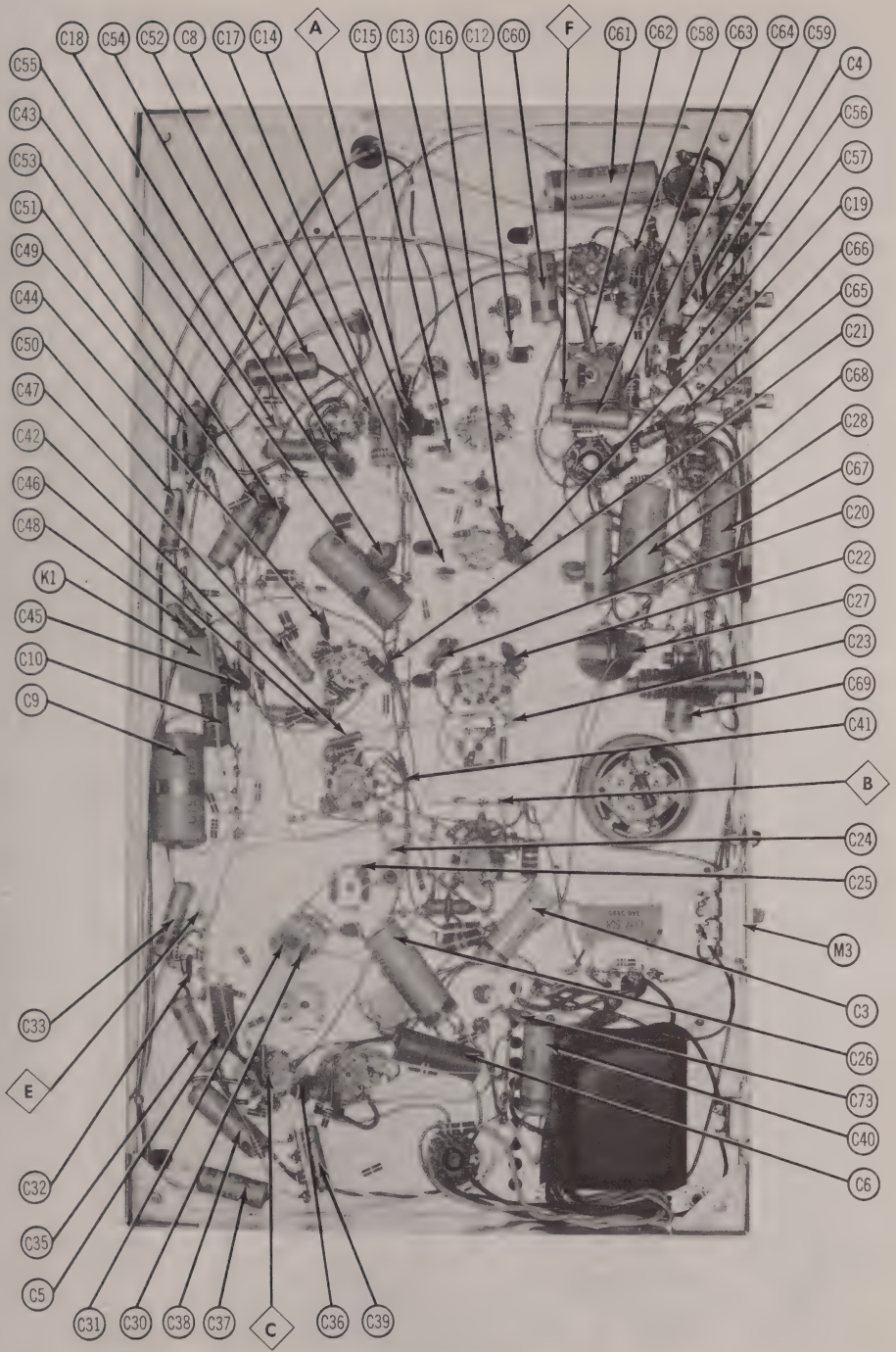
UHF TUNER



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V201	RF Amp.	6FH5
V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	100 N150					*		10TCP-T10
C202	100 N150					*		10TCP-T10
C203	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C204	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C205	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C206	27 N750 10%		N750-DI 25	TCN-27	C10Q27U	CCTN-270	CN7-427	10TCU-Q27
C207	30							
C208	28			TCZ-27	C10Q27C	CCTN-270	CN7-427	10TCU-Q27
C209	1000		EF-001	MFT-1000		CCF-102	CT280A	
C210	1.8-7			829-7				
C211	100			MFT-100				
C212	.5-3.5							
C213	.5-3.5							
C214	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C215	1000		BPD-001	DD-102	BYA10DI	CCD-102	GP210	10TS-D10
C216	18		NPO-DI 20	TCZ-18	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C217	6.8		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C218	1000		BPD-001	DD-102	BYA10DI	CCD-102	GP210	10TS-D10
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

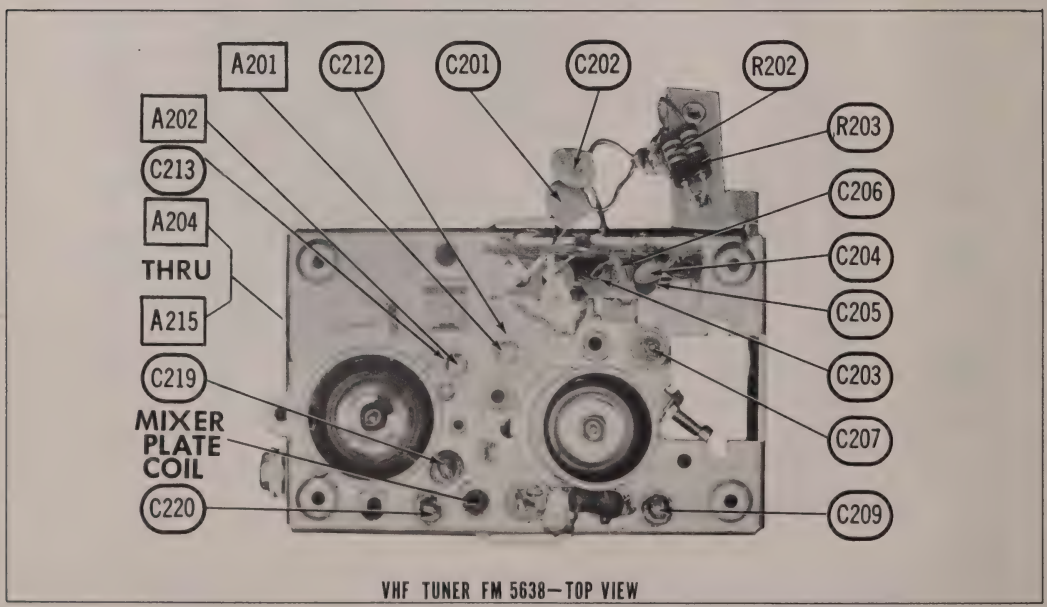
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

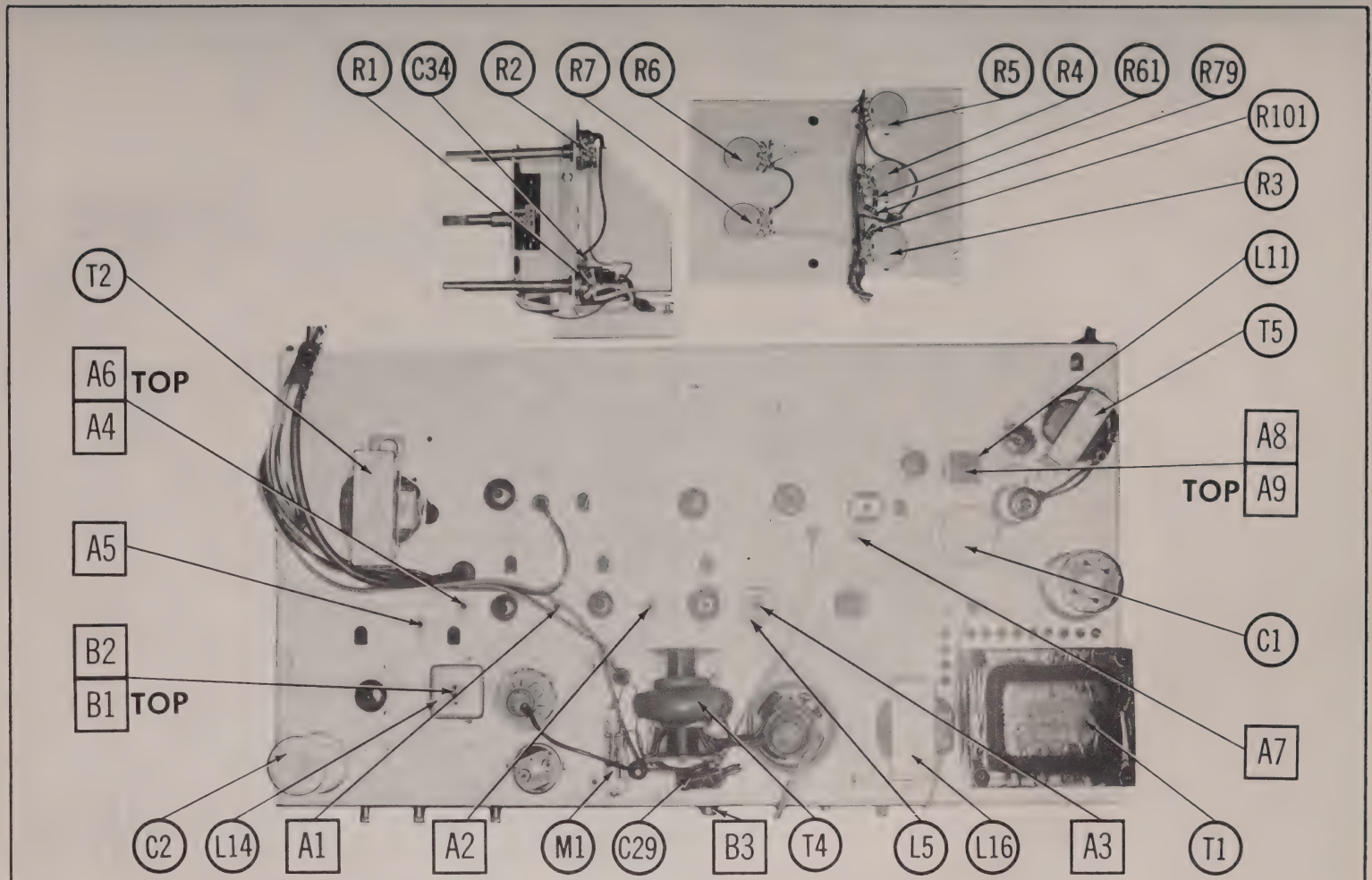
ITEM No.	RATING	REMARKS
R201	47K	
R202	560K	
R203	560K	

ITEM No.	RATING	REMARKS
R204	1000Ω	
R205	2700Ω	
R206	220K	

ITEM No.	RATING	REMARKS
R207	4700Ω	
R208	1000Ω	
R209	4700Ω	



VHF TUNER FM 5638—TOP VIEW



CHASSIS - TOP VIEW

ANDREA CHASSIS
VS323-1

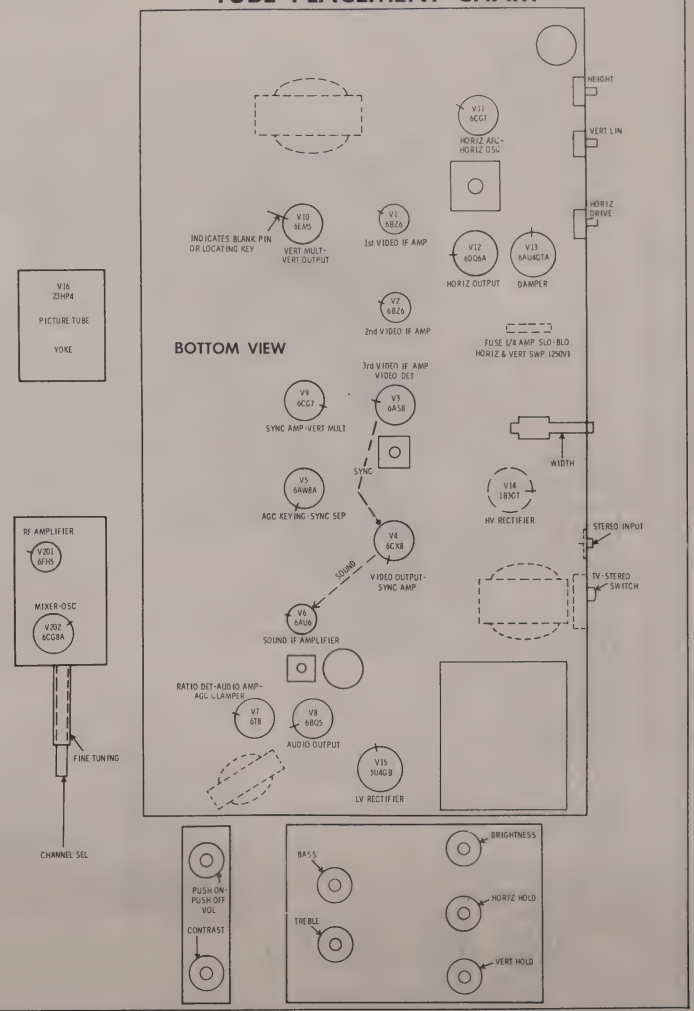
FOLDER 2

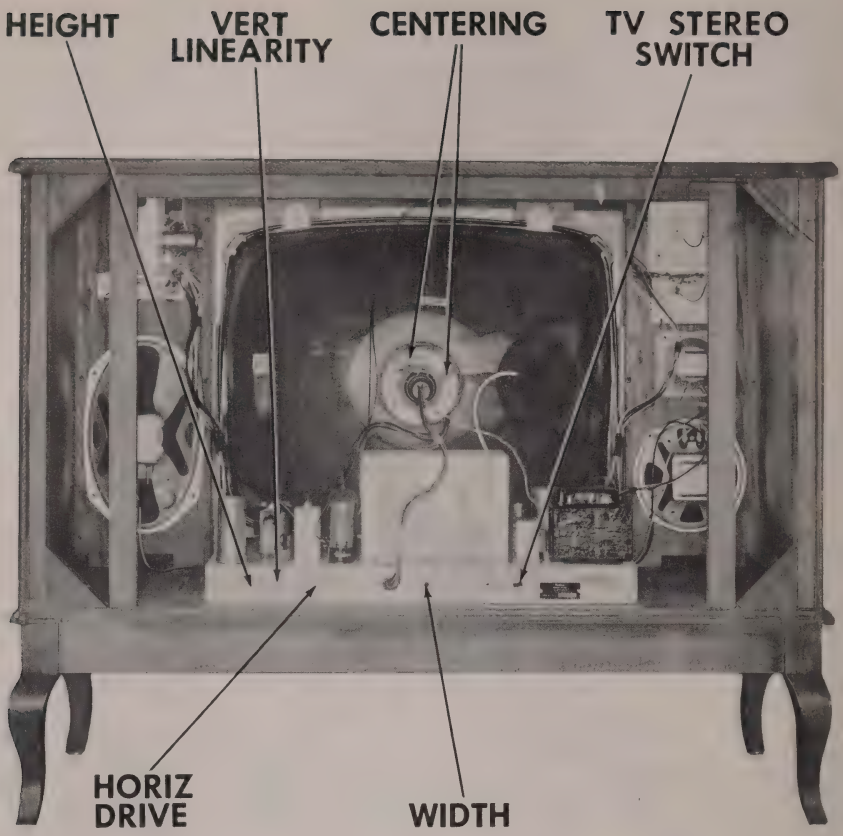
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	160K	68Ω	0Ω	.1Ω	†3300Ω	†3300Ω	0Ω		
V2	6BZ6	160K	47Ω	0Ω	.1Ω	†3300Ω	†3300Ω	0Ω		
V3	6AS8	†4300Ω	.1Ω	220Ω	0Ω	.1Ω	4700Ω	220Ω	.5Ω	†4300Ω
V4	6CX8	0Ω	8500Ω	†9000Ω	0Ω	.1Ω	• 200Ω	4700Ω	†18K	†5000Ω
V5	6AW8A	0Ω	2.7meg	†50K	0Ω	.1Ω	†2300Ω	†9000Ω	†45Ω	270K
V6	6AU6	2.8Ω	0Ω	0Ω	.1Ω	†3300Ω	†3300Ω	100Ω		
V7	6T8	520K	22K	520K	.1Ω	0Ω	370K	0Ω	4.7meg	†430K
V8	6BQ5	NC	•50K	220Ω	.1Ω	0Ω	NC	†700Ω	NC	†370Ω
V9	6CG7	• †730K	• 2meg	0Ω	.1Ω	0Ω	†13K	†50K	10K	0Ω
V10	6EM5	†375Ω	TP	• 1.9meg	.1Ω	0Ω	• 1.9meg	0Ω	NC	†700Ω
V11	6CG7	• †100Ω	1meg	420K	.1Ω	0Ω	•†37K	500K	0Ω	0Ω
V12	6DQ6A	TP	0Ω	TP	†7800Ω	470K	TP	.1Ω	0Ω	TOP CAP †12Ω
V13	6AU4GTA	TP	NC	¶	NC	†45Ω	TP	.1Ω	0Ω	
V14	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †340Ω
V15	5U4GB	TP	¶	NC	25Ω	NC	25Ω	NC	¶	
V16	Z3HP4	0Ω	4.5Ω	†390K	†150K	NC	NC	• 230K	.1Ω	
V201	6FH5	0Ω	410K	0Ω	.1Ω	†3300Ω	0Ω	0Ω		
V202	6CG8A	4700Ω	†7000Ω	0Ω	0Ω	.1Ω	†3300Ω	†2300Ω	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 3 OF V13.
† MEASURED FROM PIN 8 OF V15.
NC NO CONNECTION
TP TIE POINT

TUBE PLACEMENT CHART





CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools: B1 ..... GENERAL CEMENT #8721, 8722
WALSCO #2519

B2, B3 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

Turn the set on and tune in a TV station, preferably with a test pattern.

Adjust the Horizontal Drive control until a vertical white line appears in the picture, then back off until the drive line just disappears.

Set Horizontal Frequency slug (B1) $\frac{1}{2}$" above can.

Connect low capacity probe of scope to point (F). Low side to chassis. Set Brightness control for normal brightness.

Turn Horizontal Hold control fully clockwise.

Adjust Horizontal Waveform slug (B2) for waveform similar to Fig. 2 with the broad and narrow peaks of equal amplitudes.

Turn Horizontal Frequency slug (B1) counterclockwise until the picture drops out of sync, then turn clockwise until the picture locks in and straightens out at top. Continue to turn clockwise one half turn.

Set Horizontal Hold control to the center of its lock-in range.

Adjust Horizontal Width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

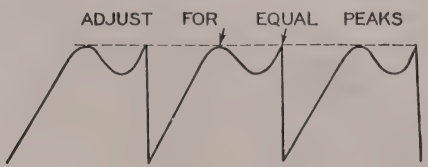
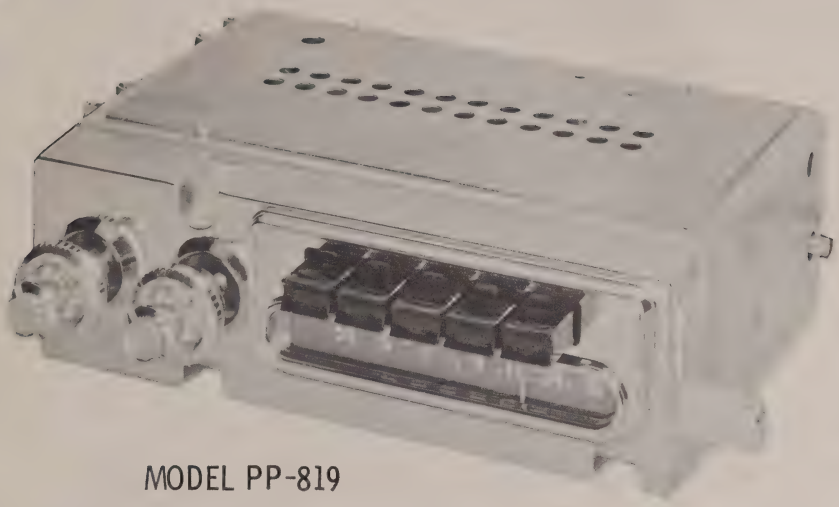


FIG. 2

PHOTOFACT® Folder

AUTOMATIC MODELS
PAP-69, PP-819

AUTOMATIC MODELS
PAP-69, PP-819



MODEL PP-819

TRADE NAME	Automatic Models PAP-69, PP-819 (For 1959 Plymouth Automobiles)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.
TYPE SET	Battery Operated 4 Tube, 2 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	538 — 1610KC RATING 1.5 Amp. @ 12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1 thru A4...GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6.....GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	265KC (400~ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1610KC	"	"	A5	"
3.	Antenna receptacle thru dummy (Fig. 1).	"	"	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

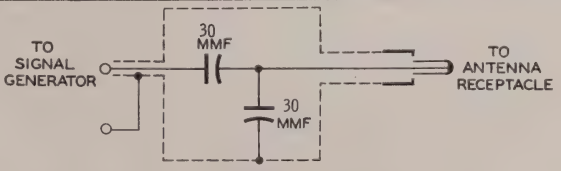


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JD838

SET 495 FOLDER 3

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BL6 (12AF6)*	V3	IF Amplifier	12BL6 (12AF6)*
V2	Converter	12AD6	V4	Det. -AVC-AF Amp.	12AE6 (12FT6)*

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N363	Driver	2N36B	2N406	2N363	2N406	PNP
X2	CT1124	Output				2N242	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	750	3	20-757	SRE3V500	BR1000-6	PETA190	TD-1000-6	TVAS-1097*	
C2A	▲500	15	20-317	AFH3-00-95		WP200.6		TVLS-2157*	
B	■500	15							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3		#28-800K						
C4	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C5	12		DI-12	DD-120	L10Q12	CCD-120	GP412	10TS-Q12
C6A								
B	40	#28-4046	NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C								
C7	100 N750		N750-DI 100	DTN-100	C10TIU	CCTN-101	CN7-310	10TCU-T10
C8	27		DI-27	DD-270	L10Q27	CCD-270	GP427	10TS-Q27
C9	2000	(3000) †	BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	3000	(10000) †	BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	3000	Note 1	BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30

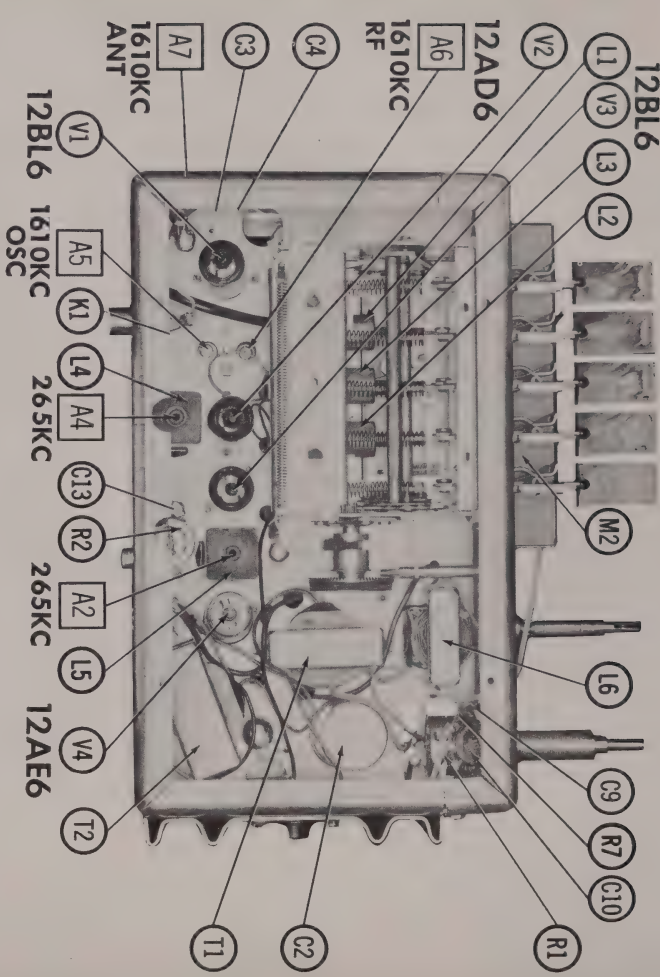
\# Automatic Part Number.
† Alternate Value.
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg		80A1020	F1-68				Tone
B	1meg 600K Tap			R2-60	RTV-689C	†QJ-1131A		Volume
C	Bushing			AK-28	XB-1			
D	Switch			KR-4				Power Off-On
R2	500Ω	2(WW)	62-501		39-500-100	112-500-100	FL-600S	Bias

† "Concentrikit" equivalent: K-8 Kit with base elements & shafts: B13-139, P14-121 (Panel)
B19-137X, R1-205 (Rear)
S24 (Bushing)
76-1 (Switch)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1meg	
R4	47K	
R5	150Ω	Note 1
R6	47K	
R7	100K	

ITEM No.	RATING	REMARKS
R8	120Ω	
R9	2.2meg	
R10	6800Ω	
R11	10K	
R12	220Ω	

ITEM No.	RATING	REMARKS
R13	1Ω 1W	
R14	22Ω	
R15	470K	
R16	150Ω	(330Ω) *

* Alternate Value.

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		AUTOMATIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	†						† Part of M2
L2	RF Coil	†						
L3	Osc. Coil	†						
L4	1st IF Trans.	14-265X	16-6752	16-6752	BC-350	12-H1	RF-3	
L5	2nd IF Trans.	14-267X	16-6754	16-6754	BC-354	12-H6		

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L6	1.35A	.7Ω	.008 HY	75A601						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	13	1	75A1303						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	20Ω	3-4Ω	75A1306							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	QUAM PART No.	
SP1	5"x 7"	PM	3-4Ω	73-656	57A15	

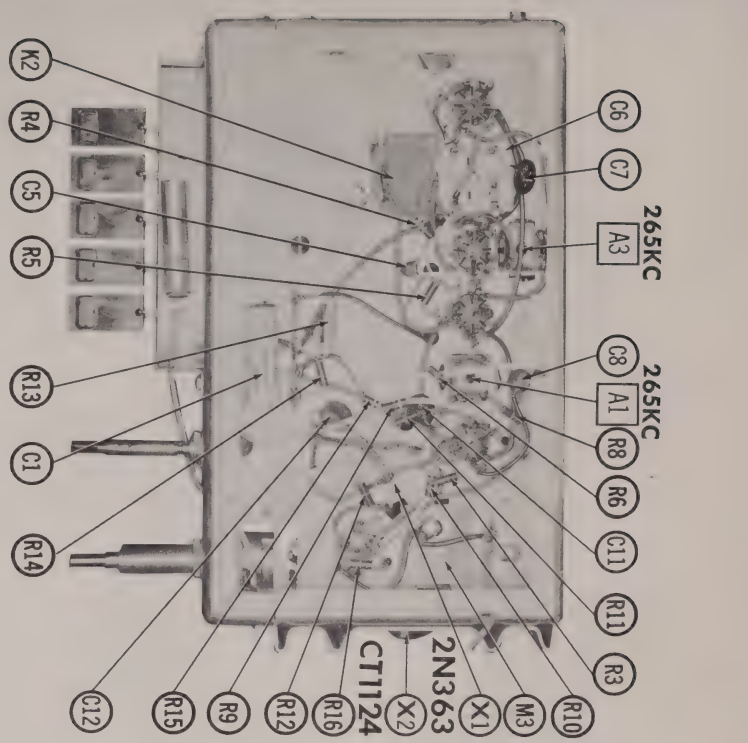
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AUTOMATIC PART No.	REPLACEMENT DATA
K1	Antenna Filter	100mmf, 1.2meg	89-4204	Sprague PRC-9
K2	RF, Conv. & IF Coupling	3000mmf, 5000mmf, .047mfd, 1500Ω, 150K, 2.2meg, 4.7meg, 10meg, 10meg	89-591	Sprague DT-14

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V			30707.5	155009	SFE 7½	HHH

CHASSIS—BOTTOM VIEW



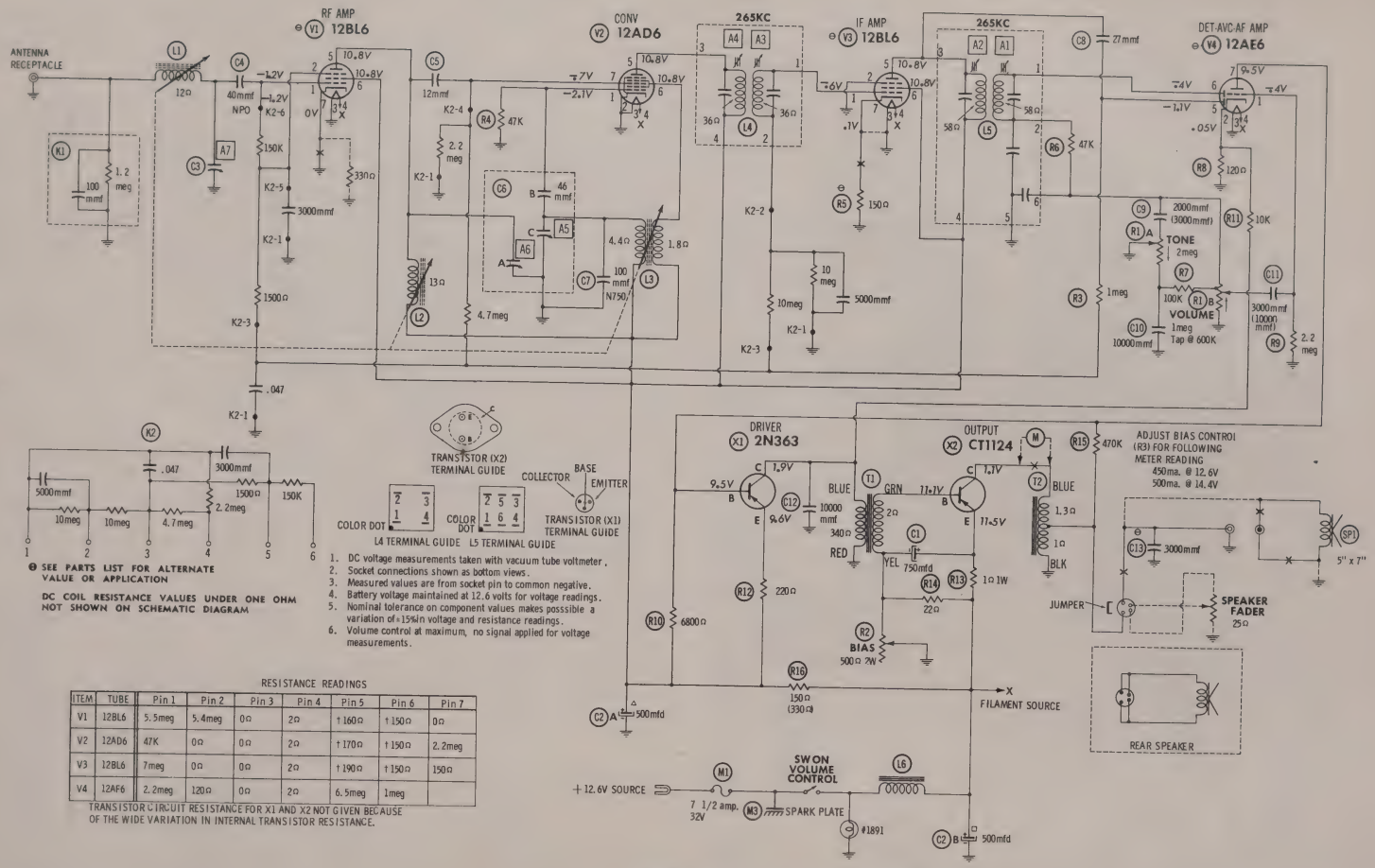
MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M2	Tuner	78B1017 (or) 78B1028	Complete
M3	Spark Plate		

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	48A1013	Tuning, Volume
Knob	48A1012	Tone, Dummy



❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	5.5meg	5.4meg	0Ω	2Ω	↑160Ω	↑150Ω	0Ω
V2	12AD6	47K	0Ω	0Ω	2Ω	↑170Ω	↑150Ω	2.2meg
V3	12BL6	7meg	0Ω	0Ω	2Ω	↑190Ω	↑150Ω	150Ω
V4	12AF6	2.2meg	120Ω	0Ω	2Ω	6.5meg	1meg	

TRANSISTOR CIRCUIT RESISTANCE FOR X1 AND X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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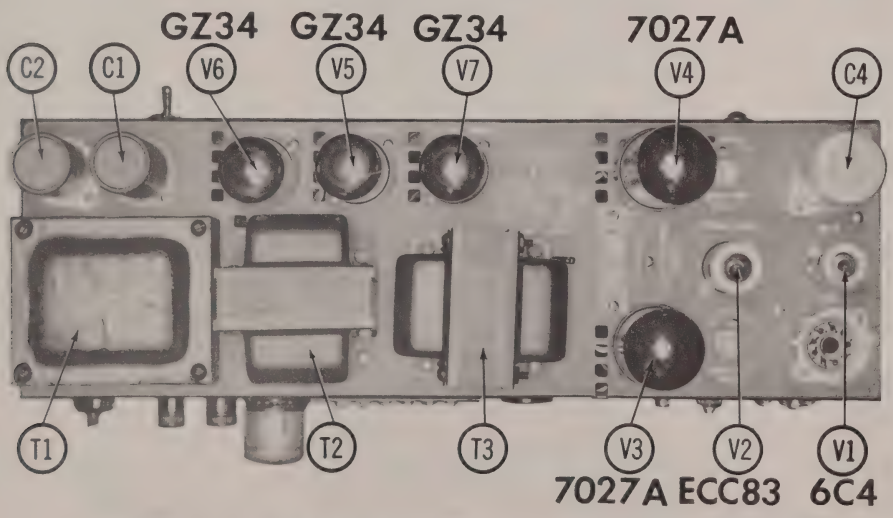
AUTOMATIC MODELS
PAP-69, PP-819

PHOTOFACT® Folder

BOGEN
MODEL MO60

BOGEN
MODEL MO60

TRADE NAME	Bogen Model MO60
MANUFACTURER	Bogen-Presto Co., A Div. of the Siegler Corp., P. O. Box 500, Paramus, N. J.
TYPE SET	AC Operated 7 Tube 60 Watt Audio Amplifier
POWER SUPPLY	110-120 (or) 125 Volts AC, 60 Cycles RATING 125 Watts, 1.25 Amp. @117 Volts AC



BOGEN
MODEL MO60

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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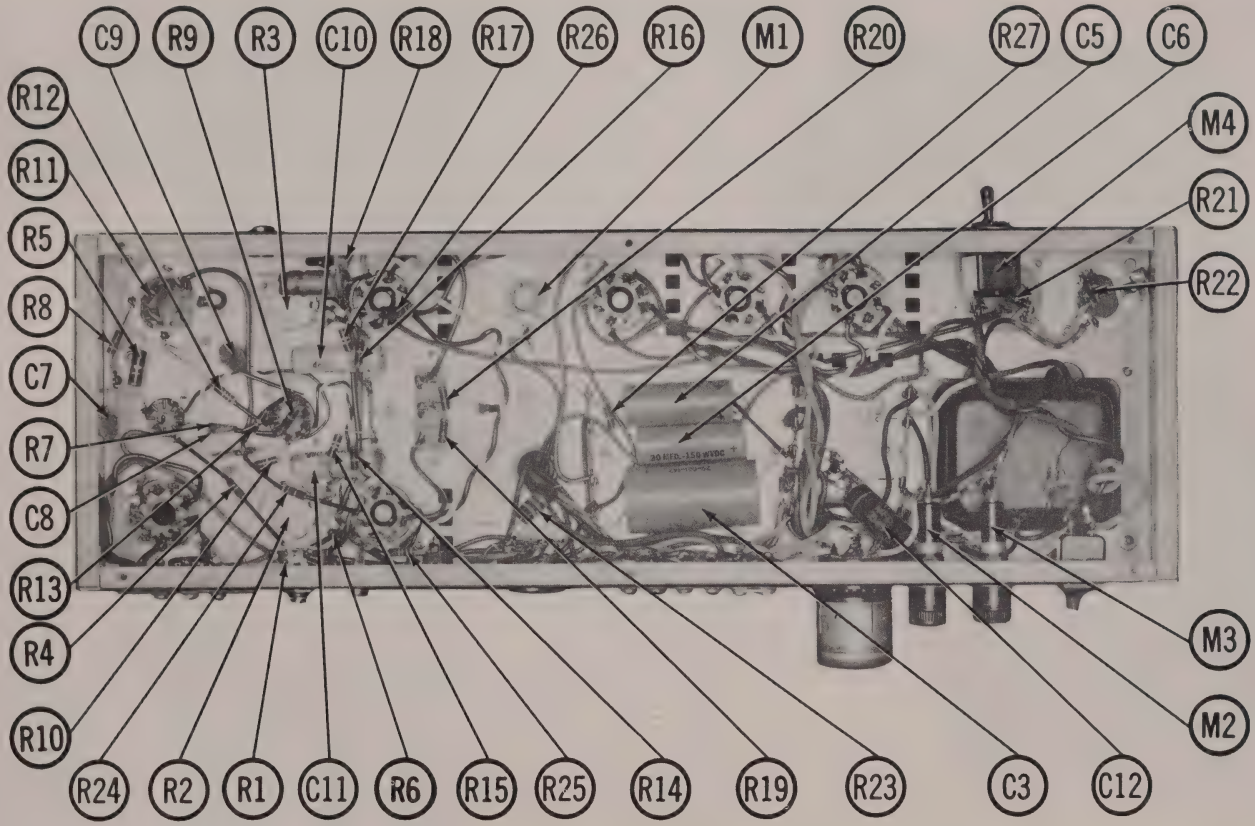
KX118

SET 495 FOLDER 4



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA)
V1	AF Amplifier	6C4
V2	AF Amplifier	ECC83/12AX7
V3	Output	7027A
V4	Output	7027A
V5	Rectifier	GZ34/5AR4
V6	Rectifier	GZ34/5AR4
V7	Rectifier	GZ34/5AR4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BOGEN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	40	300		AFH1-40	A0380	FP146	TMS-37	TVL-1621	
C2	40	300		AFH1-40	A0380	FP146	TMS-37	TVL-1621	
C3	20	500		PRS1830	BR2050	TC83	TD-20-500	TVA-1906	
C4A	▲20	450		AFH2-69	B0500	FP282.5	TMD-61	TVL-2935	
B	▲20	450							
C5	30	150		PRS1460	BR3015	TC47	TD-30-150	TVA-1412	
C6	30	150		PRS1460	BR3015	TC47	TD-30-150	TVA-1412	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	EMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	1200 10%		DI-1200	DD-122	1R5D12	CCD-122	GP212	10TS-D12
C8	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C11	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C12	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BOGEN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100K	½	77-001-478	AB-41	A47-100K-Z	B13-128	U39	Volume
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	
R2A	10K	½	77-001-400	AB-14	A47-10K-S	B11-116	SU-20	Bias #1
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	
R3A	10K	½	77-001-400	AB-14	A47-10K-S	B11-116	SU-20	Bias #2
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	10K	
R5	82K 1W	
R6	1200Ω	
R7	6.8meg	
R8	1600Ω	
R9	1meg	
R10	82K	
R11	15K	
R12	47K	
R13	82K	
R14	1000Ω	
R15	100K	
R16	1000Ω	
R17	100K	
R18	1000Ω	
R19	10Ω	
R20	10Ω	
R21	1meg	
R22	1meg	
R23	33K 2W	
R24	4700Ω	
R25	47K	
R26	.47Ω	
R27	2200Ω	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	REPLACEMENT DATA BOGEN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	125V ⓐ .66A. Tap ⓐ 117V ⓐ .69A	840 VCT ⓐ .100A Tap ⓐ 670VCT ⓐ .010A. Tap ⓐ 65V ⓐ .010A	83-613-000						

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA BOGEN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V ⓐ .55A	5V ⓐ 3.8A	5V ⓐ 1.9A	83-614-000						
	SEC. 3	SEC. 4	*SEC. 5							
	6.3 VCT ⓐ 3.3A	6.3 VCT NOT USED								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.1	REPLACEMENT DATA BOGEN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	5200Ω CT	16Ω Tap ⓐ 8Ω, 4Ω	83-300-000							
		SEC. 2								
		82Ω								

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BOGEN PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.010A	H-373 *	D-5410 *	1159 *	10 *		* Selenium Type

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA BOGEN PART No. FUSE	BOGEN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	1½A 125V S/B			31301.5 (3AG 1½A 125V)	342001	MDL 1½	HKP
M3	3AG	½A 125V S/B			313.500 (3AG ½A 125V)	342001	MDL ½	HKP

MISCELLANEOUS

ITEM No.	PART NAME	BOGEN PART No.	NOTES
M4	Switch		Power Off-On

WIRING DATA

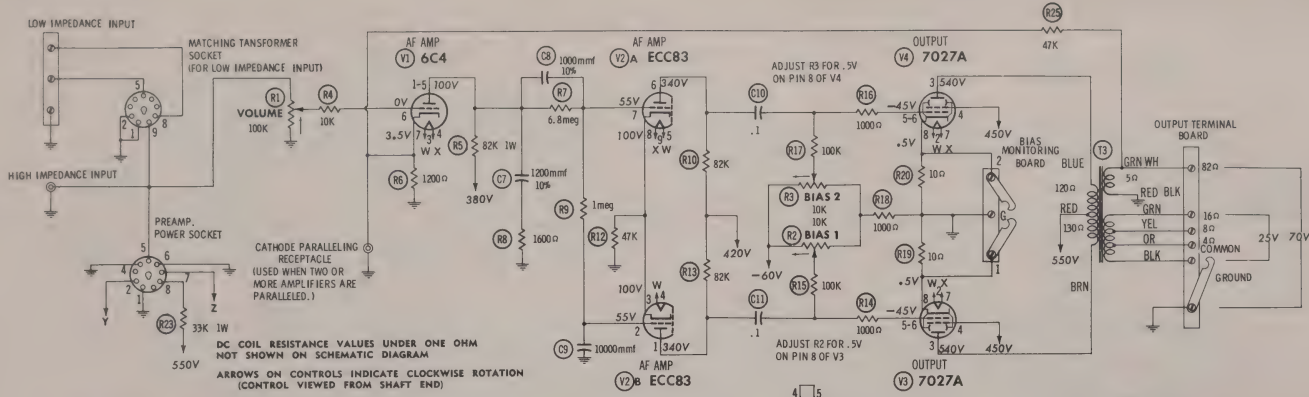
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

ADJUSTMENT

BIAS ADJUSTMENT (R2, R3)

Set Volume control fully counterclockwise. Rotate Bias #1 and #2 fully clockwise. Remove links on the Bias Terminal strip. Connect DC probe of VTVM to terminal #1 of Bias strip, common to ground terminal. Adjust Bias #1 for .5 volts on VTVM. Move DC probe to terminal #2 and adjust Bias #2 for .5 volts on VTVM. Replace both links.

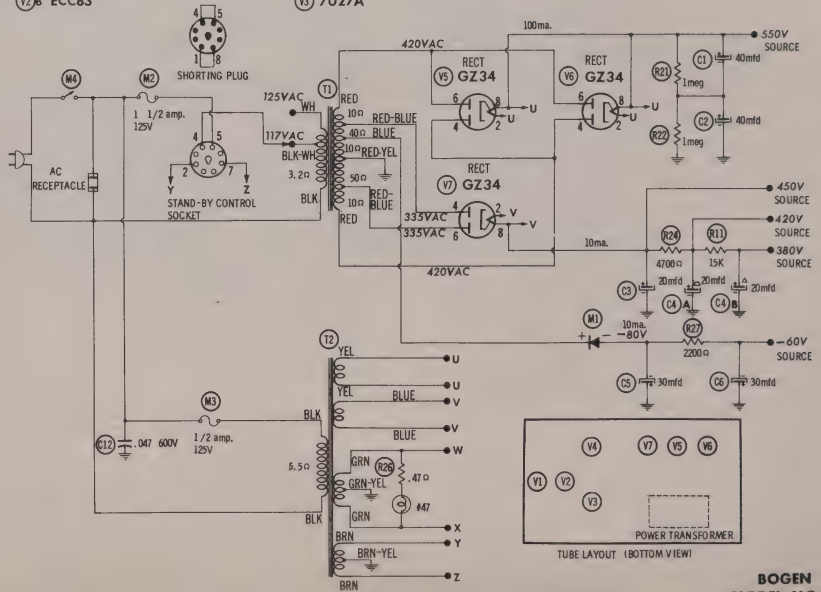


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6C4	†100K	NC	.1Ω	.1Ω	†100K	10K	1200Ω		
V2	ECC83 12AX7	†85K	†7.9meg	47K	.1Ω	.1Ω	†85K	†6.9meg	47K	.1Ω
V3	7027A	NC	.1Ω	††120Ω	†0Ω	150K	NC	.1Ω	10Ω	
V4	7027A	NC	.1Ω	††130Ω	†0Ω	150K	NC	.1Ω	10Ω	
V5	GZ34 5AR4	NC	¶	NC	60Ω	NC	60Ω	NC	¶	
V6	GZ34 5AR4	NC	¶	NC	60Ω	NC	60Ω	NC	¶	
V7	GZ34 5AR4	NC	¶	NC	50Ω	NC	50Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 8 OF V5.
† MEASURED FROM PIN 8 OF V7. NC NO CONNECTION



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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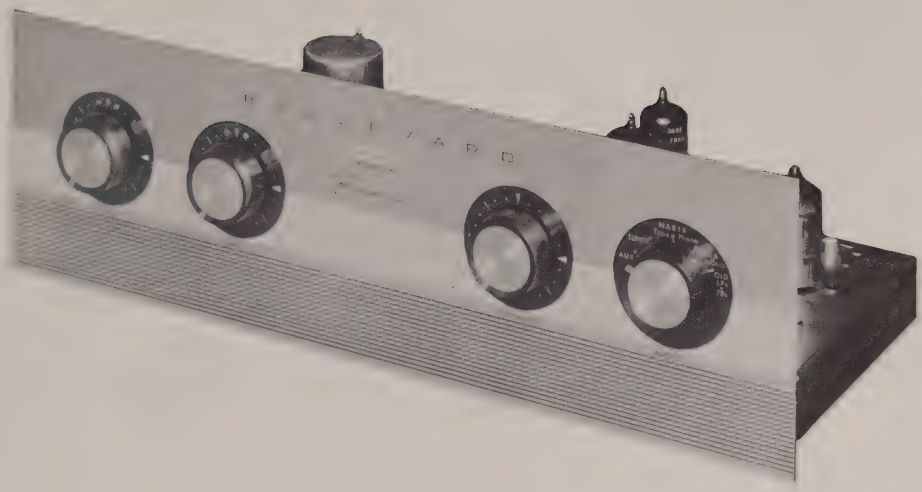
BOGEN MODEL MO60

PHOTOFACT® Folder

BOULEVARD
MODEL Prince

BOULEVARD
MODEL Prince



BOULEVARD
MODEL Prince

TRADE NAME	Boulevard Model Prince
MANUFACTURER	Boulevard Electronics, 1229 W. Washington Blvd., Chicago 7, Illinois
TYPE SET	AC Operated 5 Tube Audio Amplifier
POWER SUPPLY	100 - 130 Volts AC, 60 Cycles RATING 81 Watts, .8 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JX840

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Preamp. -AF Amp.	ECC83 (ECC83/7025)*	V4	Output	EL84/6BQ5
V2	AF Amp. -Phase Inv.	ECC83 (ECC83/7025)*	V5	Rectifier	EZ81 (EZ81/6CA4)*
V3	Output	EL84/6BQ5			

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BOULEVARD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■50	400			C0885	FP376.7		TVL-4739	
B	■40	350			BR3035	TC79			
C	▲30	300							
D	30	300							
C2	50	25		SRE25V50	BBR50-25	TC29	TD-50-25	TVA-1206	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	47 N075							
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C7	47 N075							
C8	47		SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C9	200		SI 200	D6-201	L10T2	CCD-201	GP320	10TS-T20
C10	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	100000 50V	(10000) †		DA-104	H-05P1	1DP-2-104	TA-010	5HK-P10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C15	.002 600V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C16	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	47 N075							
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	270 N750 5%			TCN-270	C10T27U		CN7-327	10TCU-T27
C23A	10000 1400V		DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10
B	10000 1400V		DAC-27	DD16-103	HVE16S1	16DP-3-103	UAC-110	BL-S10

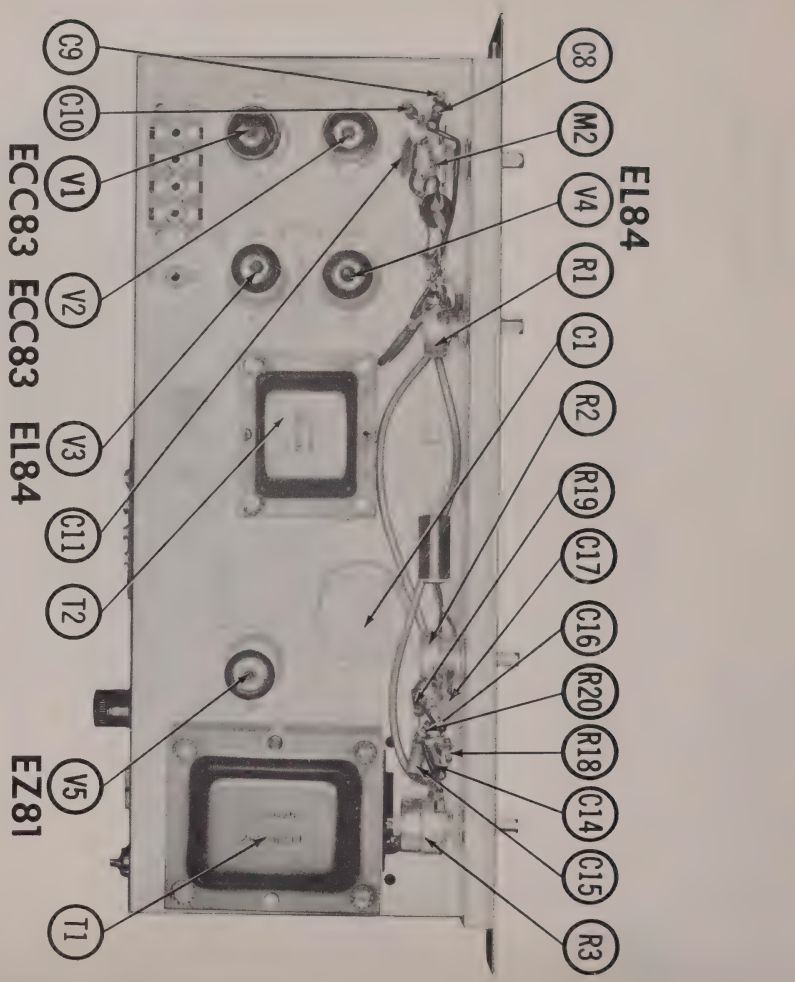
† Alternate Value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BOULEVARD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	BA811-2883	B-70	A47-1meg-Z	Q13-137	U53	Loudness
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1meg	½	BA811-2879	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1meg	½	BA812-1236	B-69	A47-1meg-S	Q11-137	U54	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On
R4	125Ω	2(WW)		WN-101①				Hum Balance

① Solder ground lug (Part #AK-30) to center tap.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	2meg	
R6	1meg	
R7	47K	
R8	27K 1W	
R9	120K	
R10	120K	
R11	4.7meg	
R12	220K	
R13	470K	
R14	470K	

ITEM No.	RATING	REMARKS
R15	12meg	(10meg) *
R16	470K	
R17	150K	
R18	120K	
R19	27K 1W	
R20	120K	
R21	470K	
R22	2200Ω	
R23	100K	
R24	12meg	(10meg) *

ITEM No.	RATING	REMARKS
R25	56K	
R26	56K	
R27	470K	
R28	130Ω 4W	
R29	470K	
R30	1000Ω 10W	
R31	2200Ω	
R32	22K	

* Alternate Value.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	BOULEVARD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ .8A	600 VCT Ⓐ .100A	6.3V Ⓐ 3.1A	112B-382	22R04①	P-3052①			22R04①	

① Tape 5V. Winding

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	BOULEVARD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7000Ω CT	16Ω Tap Ⓐ 8Ω, 4Ω	78B-420	22S66 ①	A-3027①		A-3885①	22S66①		

① Drill new mounting holes.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BOULEVARD PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	5A 250V			312005 (3AG 5A 250V)	342001	MTH5	HKP

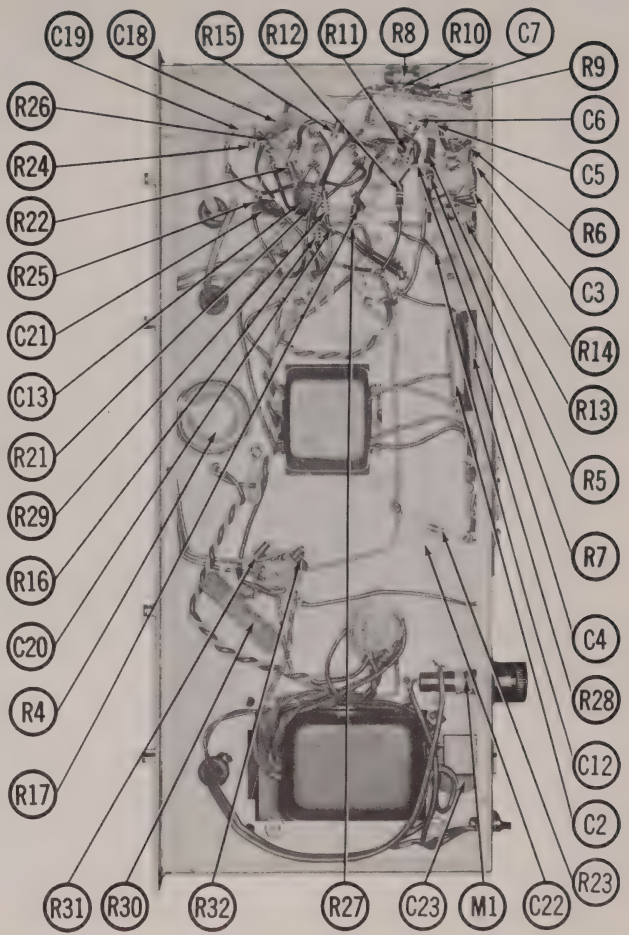
MISCELLANEOUS

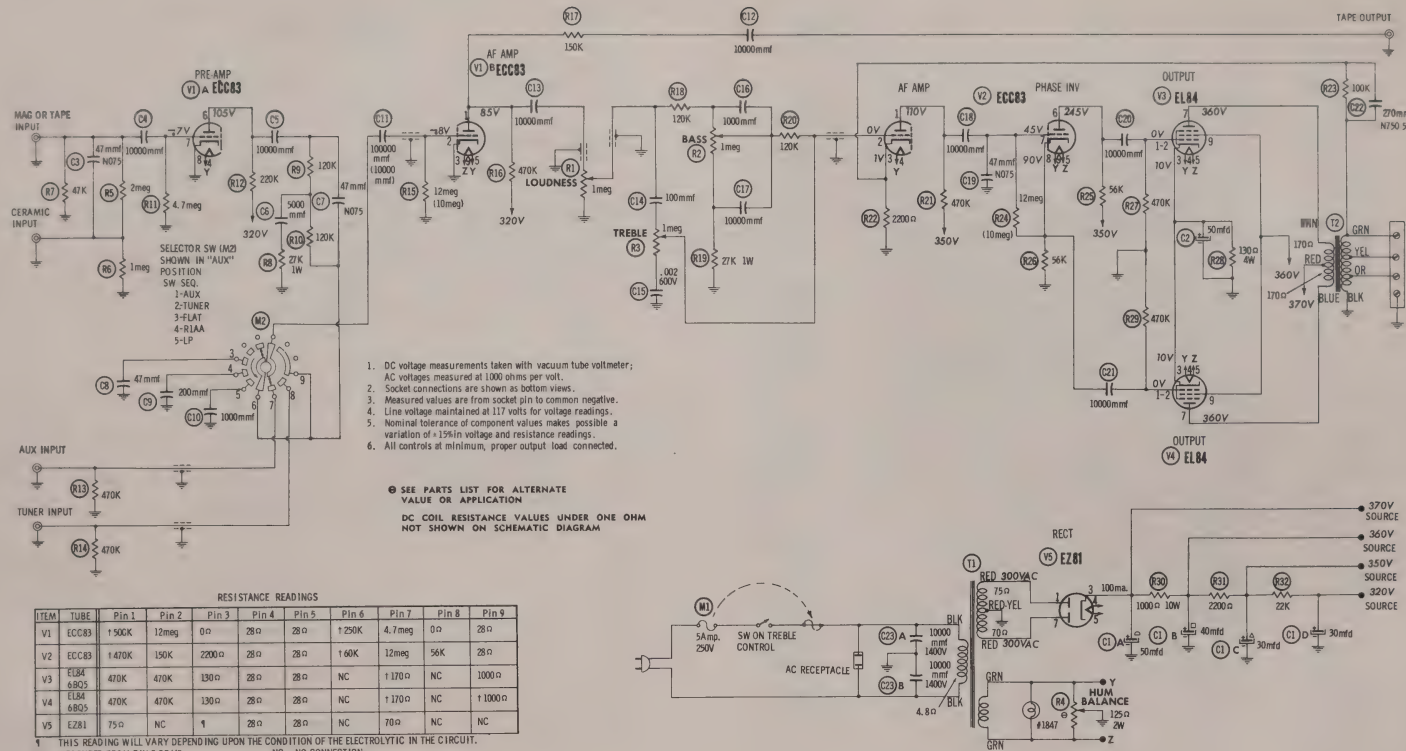
ITEM No.	PART NAME	BOULEVARD PART No.	NOTES
M2	Switch		Mode

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83	†500K	12meg	0Ω	28Ω	28Ω	†250K	4.7meg	0Ω	28Ω
V2	ECC83	†470K	150K	2200Ω	28Ω	28Ω	†60K	12meg	56K	28Ω
V3	EL84 6BQ5	470K	470K	130Ω	28Ω	28Ω	NC	†170Ω	NC	1000Ω
V4	EL84 6BQ5	470K	470K	130Ω	28Ω	28Ω	NC	†170Ω	NC	†1000Ω
V5	EZ81	75Ω	NC	¶	28Ω	28Ω	NC	70Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V5. NC NO CONNECTION.

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BOULEVARD
MODEL Prince

PHOTOFACT® Folder with CIRCUITRACE®

CHANNEL MASTER
MODELS 6503, 6504

CHANNEL MASTER
MODELS 6503, 6504

CHANNEL MASTER
MODELS 6503, 6504

TRADE NAME	Channel Master Models 6503, 6504
IMPORTER	Channel Master Corp., Ellenville, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	6MA@9 Volts DC (No Signal, Min. Volume)
TUNING RANGE–BROADCAST	530 – 1650KC
	8MA@9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A4, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output.
2.	Loop	530KC	Tuning gang fully closed.	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1650KC	Tuning gang fully open.	"	A4	Adjust for maximum output. Repeat Steps 2 and 3.
4.	"	600KC	Tune to 600KC signal.	"	A5	Adjust for maximum output.
5.	"	1400KC	Tune to 1400KC signal.	"	A6	Adjust for maximum output. Repeat Steps 4 and 5.

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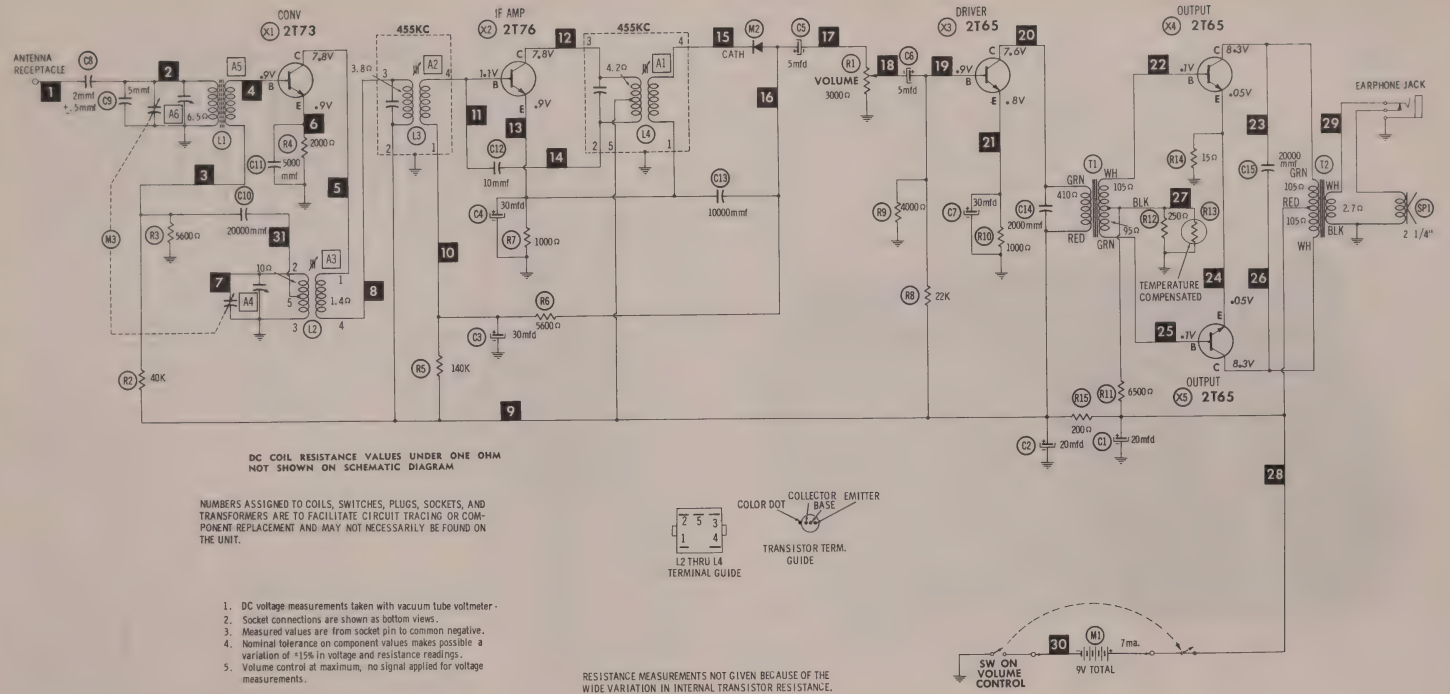
JF718

SET 495 FOLDER 6



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

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CHANNEL MASTER MODELS 6503, 6504

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2T73	Converter			2N1366	2N212	NPN
X2	2T76	IF Amp.			2N1367		NPN
X3	2T65	Driver	2N438	2N649		2N214	NPN
X4	2T65	Output	2N438	2N649		2N213	NPN } Matched
X5	2T65	Output	2N438	2N649		2N213	NPN } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Channel Master PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	20	9	A011		ECPA210			TE-1130	
C2	20	9	A011		ECPA210			TE-1130	
C3	30	6	A009		ECPA112			TE-1130	
C4	30	6	A009		ECPA112			TE-1130	
C5	5	6	A010	XPP-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C6	5	6	A010	XPP-6005	NLW5-6	TT6X5	ML5-6	TE-1084	
C7	30	6	A009		ECPA112			TE-1130	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C8	2 ± .5mmf		NPO-DI 2.2	DTZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22	
C9	5		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50	
C10	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C11	5000		BPD-005	DDM-502	H-05D5	CCD-502	TA-250	TG-D50	
C12	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10	
C13	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C14	2000		BPD-002	DM-202	BYA10D2	CCD-202	GP220	5HK-D20	
C15	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Channel Master PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	3000Ω	1/4	E-006	B16-212				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	40K	
R3	5600Ω	
R4	2000Ω	
R5	140K	
R6	5600Ω	

ITEM No.	RATING	REMARKS
R7	1000Ω	
R8	22K	
R9	4000Ω	
R10	1000Ω	
R11	6500Ω	

ITEM No.	RATING	REMARKS
R12	250Ω	
R13	Temp. Comp.	#F138
R14	15Ω	
R15	200Ω	

Channel Master Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Channel Master PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	E005						
L2	Osc. Coil	F135						
L3	1st IF Trans.	C001						
L4	2nd IF Trans.	C002						

PRINTED BOARD

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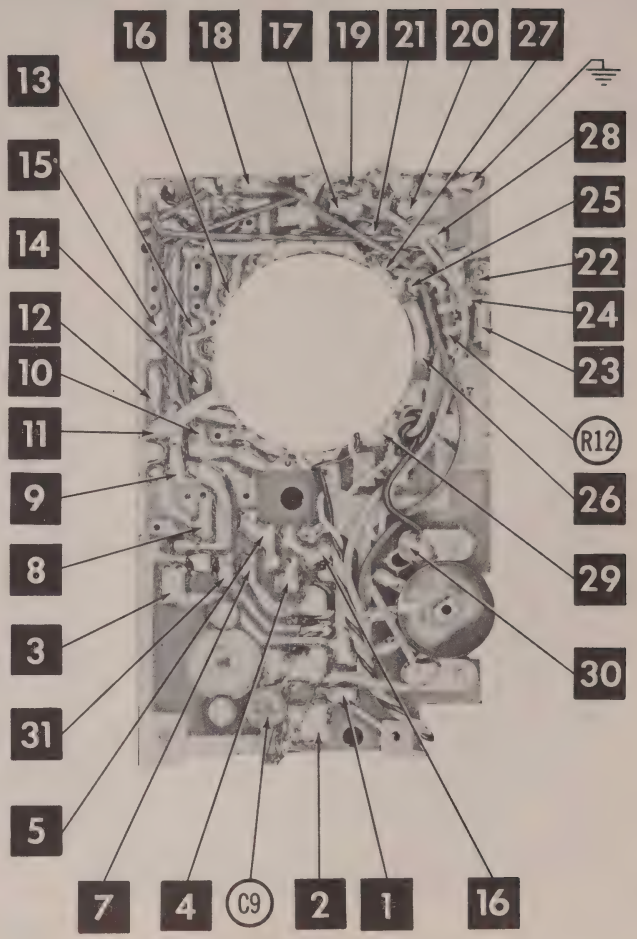


PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Channel Master PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	.8	1	C003	TR-39			TR-39		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Channel Master PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	570Ω	6-8Ω	C004	TR-50				TR-50		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Channel Master PART No.	QUAM PART No.	
SP1	2 1/4"	PM	6-8Ω	G091	22A06Z8	

BATTERIES

ITEM No.	VOLTAGE	Channel Master PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Channel Master PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		F137	1N60	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	Channel Master PART No.	NOTES
M3	Tuning Cap. Earphone	A001 E002	2 Gang

CABINETS & CABINET PARTS

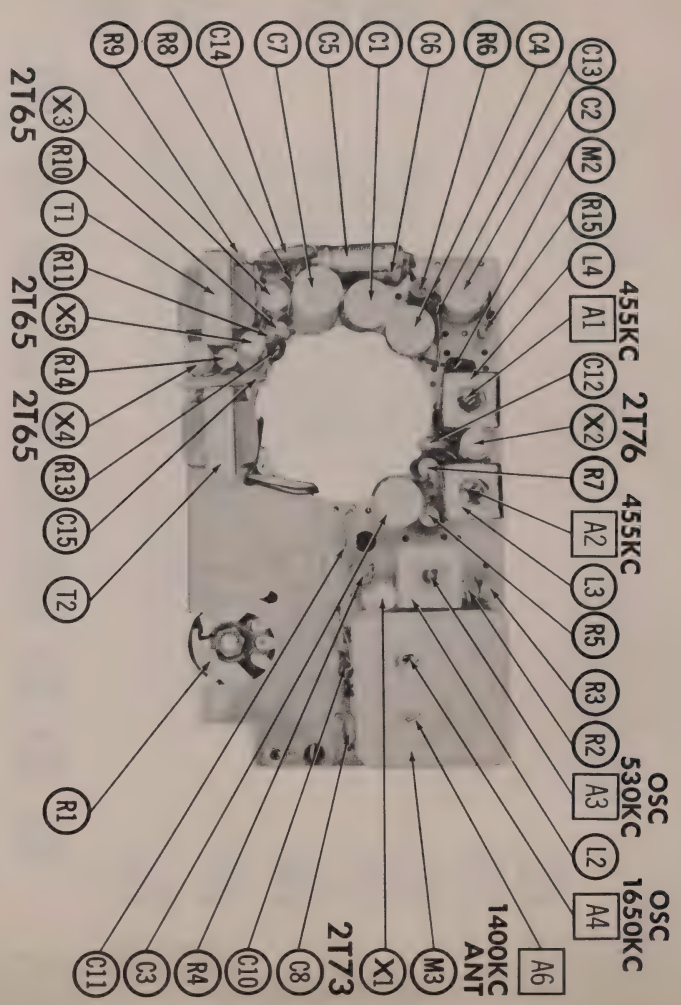
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	F002	Tuning
Knob	F003	Volume
Cabinet	G003	Black
Cabinet	G004	Red
Case	F061	Leather, With Strap (Model 6503)

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



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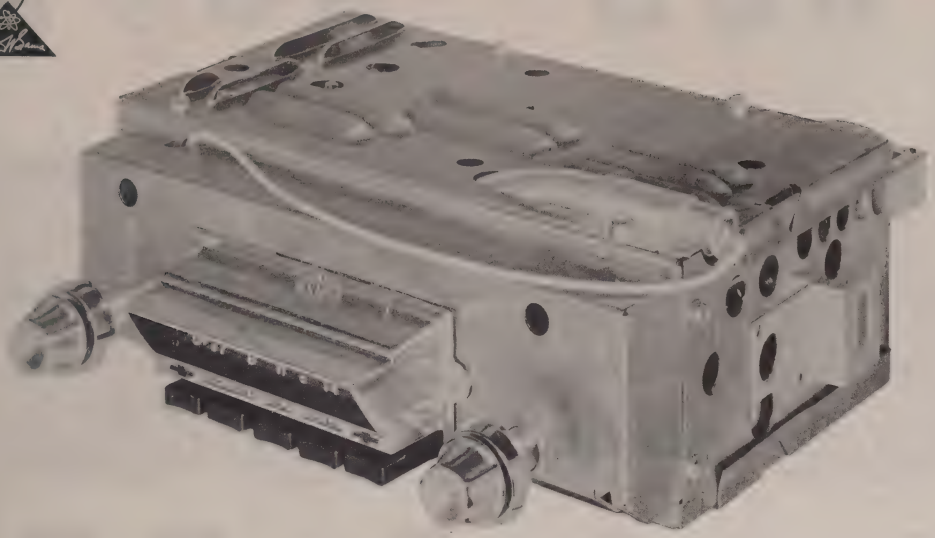
CHEVROLET
MODEL 988276

CHEVROLET
MODEL 988276



TRADE NAME	Chevrolet Model 988276 (For 1960 Chevrolet Automobiles)
MANUFACTURER	Delco Radio Div., G. M. Corp., Kokomo, Indiana
TYPE SET	Battery Operated 4 Tube, 1 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 2.5 Amp. @ 12.6 Volts DC
TUNING RANGE	BROADCAST 535 - 1615KC

CHEVROLET
MODEL 988276

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4 ..... GENERAL CEMENT #9440
A5, A9, A10 .... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A6, A7, A8 ..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	262KC (400∿ Mod.)	High freq. end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
	Check setting of Oscillator Core (A5). Rear of core should be 1 5/8" from mounting end of coil form.					
2.	High side thru 82mmf to antenna receptacle. Low side to chassis.	1615KC	High freq. end stop	Across voice coil	A6, A7, A8	Adjust for maximum output.
3.	"	600KC	600KC signal	"	A9, A10	"
4.	"	1615KC	1615KC signal	"	A7, A8	"
5.	"	1100KC	1100KC signal	"		Adjust pointer adjustment until pointer coincides with 1100Ω on dial.
6.	With radio installed in car and antenna fully extended, tune in a weak station near 900KC and adjust A8 formaximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining pushbuttons.

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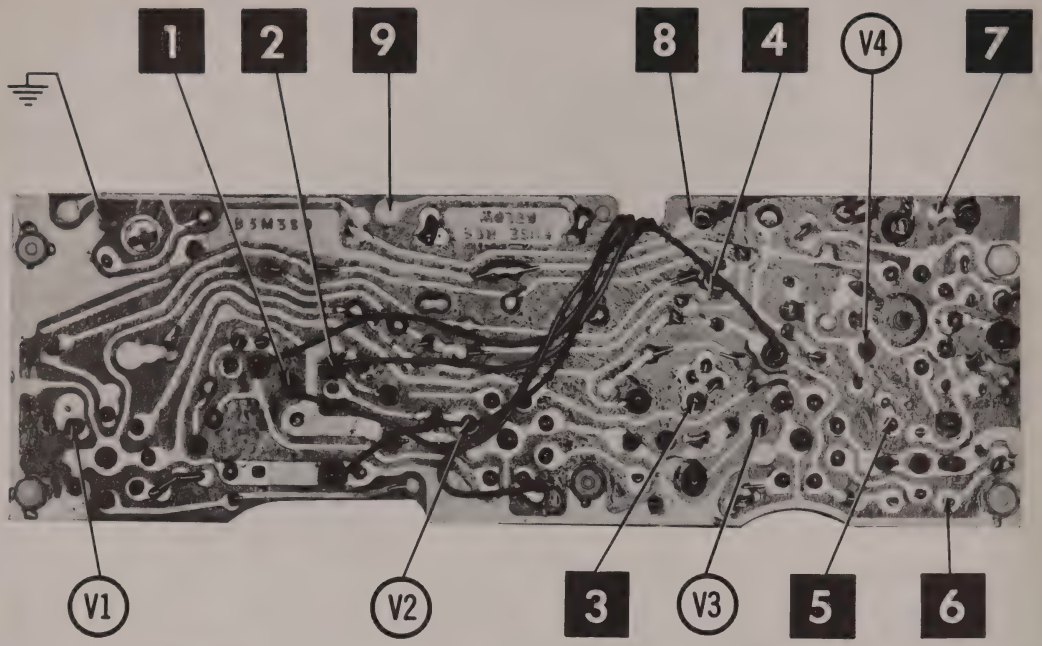
KD074

SET 495 FOLDER 7



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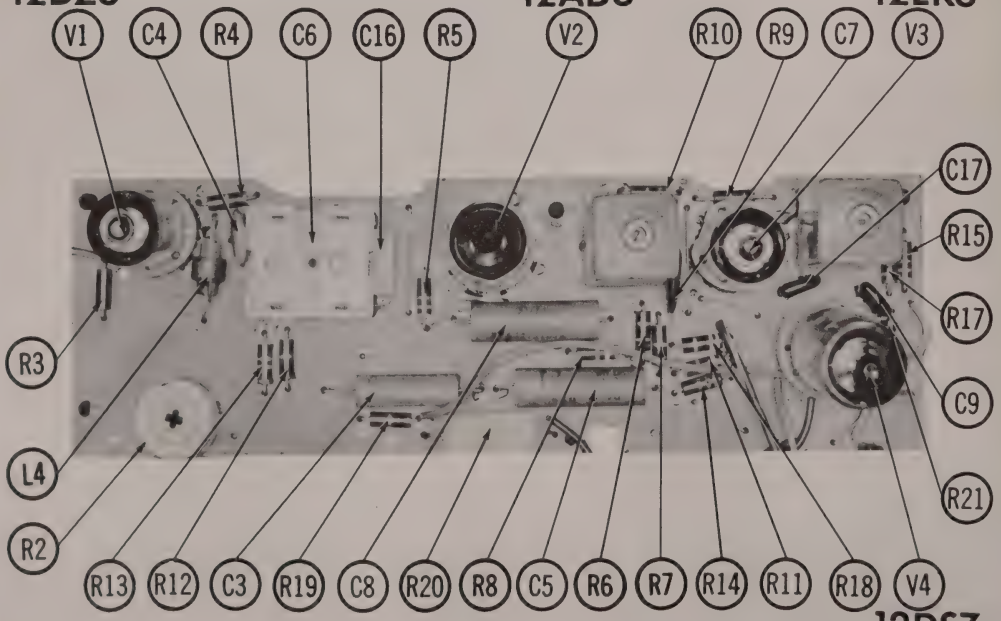
PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



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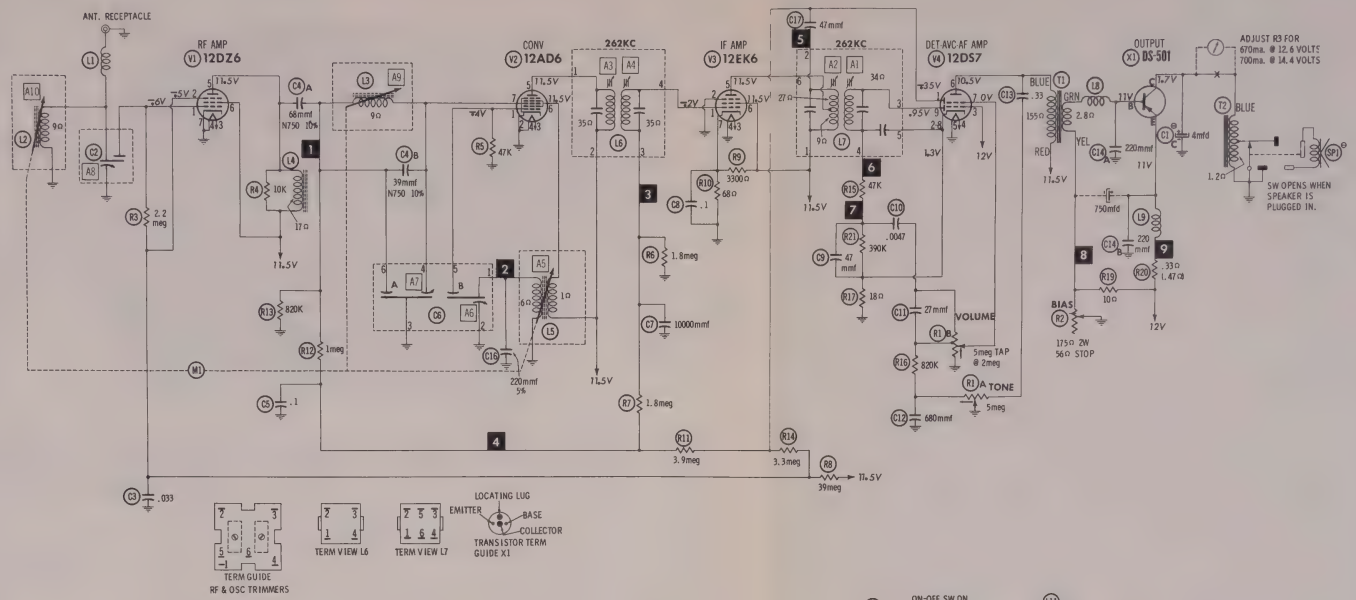

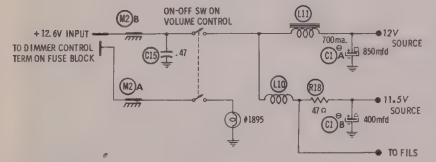

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DZ6	12meg	9.8meg	.1Ω	0Ω	60Ω	47Ω	0Ω		
V2	12AD6	47K	0Ω	.1Ω	0Ω	80Ω	48Ω	750K		
V3	12EK6	1.6meg	0Ω	.1Ω	0Ω	57Ω	47Ω	68Ω		
V4	12DS7	7meg	18Ω	.8Ω	.1Ω	0Ω	210Ω	0Ω	18Ω	435K

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN FOR X1 BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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with CIRCUITRACE®

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CHEVROLET
MODEL 988276

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12DZ6	V3	IF Amplifier	12EK6
V2	Converter	12AD6	V4	Det. - AVC - AF Amp.	12DS7

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	DS-501	Output	2N235A			2N677 *	PNP

* Mounting change, drill new mounting holes.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■850	16	7273729	AFH3-54-30		WP300.7		TVLS-3021 *	①
B	▲400	16							
C	4	11.5							

① Some versions may use 500-1000-4mfd in this application (Part #7273810).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2				#7273107						
C3	.033	75V			P288N-033	DD-303	PM4S33	1DP-2-333	GEM-4133	6TM-S33
C4A	68	N750	10%		N750-DI 68	DTN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
B	39	N750	10%			TCN-39	C10Q39U	CCTN-390	CN7-439	10TCU-Q39
C5	.1	75V			P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C6A				#7273693						
B										
C7	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.1	75V			P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C9	47				1468-000047	DD-470	22R5Q47	CM-19B-470M	MC225	1FM-447
C10	.0047	100V			P288N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C11	27				DI-27	DD-270	L10Q27	CCD-270	GP427	10TS-Q27

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C12	680			BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C13	.33	100V		P288N-33		PM4P33	2DP-5-334	GEM-2033	
C14A	220			DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
B	220			DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C15	.47	100V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C16	220		5%	1469-00022		22R5T22	CM-19B-221J	CNO-320	MS-322
C17	47			1468-000047	DD-470	5W5Q47	CM-19B-470M	GP447	1FM-447

Delco Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5meg	1/10-2W	7275710					Tone
B	5meg							Volume
	2meg Stop							
C	Switch							Power Off-On
R2	175Ω	2(WW)	1221422					Bias
	56Ω Stop							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	2.2meg	
R4	10K	
R5	47K	
R6	1.8meg	
R7	1.8meg	
R8	39meg	
R9	3300Ω	

ITEM No.	RATING	REMARKS
R10	68Ω	
R11	3.9meg	
R12	1meg	
R13	820K	
R14	3.3meg	
R15	47K	
R16	820K	

ITEM No.	RATING	REMARKS
R17	18Ω	
R18	47Ω	
R19	10Ω	
R20	.33Ω	(.47Ω) *
R21	390K	

* Alternate Value, Fuse Type (Part #7271375).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		DELCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	RF Choke	7255738	19-1004	19-1004	BC-565	4610		6.5uh

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		DELCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L2	Ant. Coil	1221138						
L3	RF Coil	1221136						
L4	RF Choke	7269684	19-1041	19-1041	BC-514	4664		1.8MH
L5	Osc. Coil	1221151						
L6	Input IF Trans.	1221257	16-6756	16-6756	BC-344	13-PH1		
L7	Output IF Trans.	1221253						
L8	RF Choke	1217846						1.4uh
L9	RF Choke	1217846						1.4uh
L10	"A" Lead Choke	1217846						1.4uh

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L11	.700A	.7Ω	.011 Hy.	7274342				TC-2		

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4.4	1	1221425			TA-48			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
	PRI.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	10Ω Tap @ 3-4Ω	1221428				TA-50			

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3-4Ω	7276056 *	69A2	* Alternate Part #7276057, 7272731

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M1	Tuner	1220886	Complete (Series P2 Pushbutton Type)
M2A	Spark Plate		Dial Lite
B	Spark Plate		"A" Lead

CABINETS & CABINET PARTS

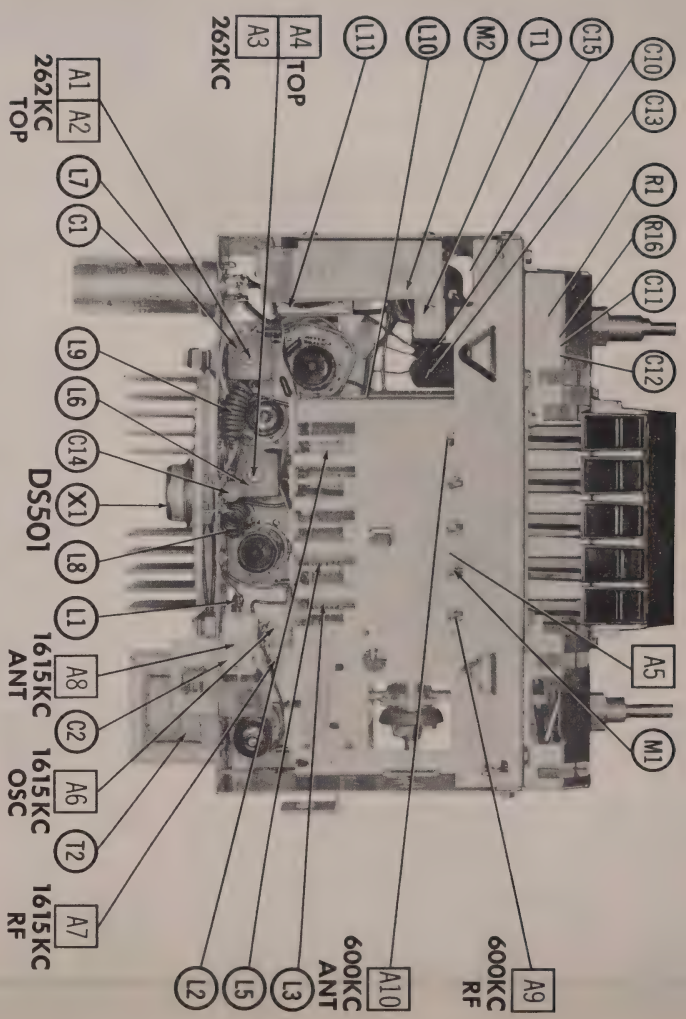
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	1990894	Tuning, Volume
Knob	7272970	Tone
Knob	7272969	Dummy
Pushbutton	1221266	Assembly, Includes Front Bearing Plate and Slides
Pushbutton	7273070	Individual
Pointer Ass'y	7273102	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire .....Use BELDEN No. 8885
Bonding Strap .....Use BELDEN No. 8661

CHASSIS—TOP VIEW



PHOTOFACT® Folder

CORONADO MODELS
PH20-4051A, PH20-4052A

CORONADO MODELS
PH20-4051A, PH20-4052A

MODEL PH20-4052A

CORONADO MODELS
PH20-4051A, PH20-4052A

TRADE NAME	Coronado Models PH20-4051A, PH20-4052A
SUPPLIER	Gamble-Skogmo, Inc., 15 N. Eighth Street, Minneapolis 3, Minn.
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 31 Watts, .32 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18
OR RECORD CHANGER MANUAL RC-12

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT831

SET495 FOLDER 8

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	V2 V3	Left Channel Output Right Channel Output	50EH5 50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	FB5925	PRS3800	BBRT84215	TCT3119	TDLT-7	TVA-3455	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C3	3500	(5000) *	BPD-004	DD-392	L10D39	CCD-392	GP239	10TS-D39
C4	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	3500	(5000) *	BPD-004	DD-392	L10D39	CCD-392	GP239	10TS-D39
C7	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C9	.25 400V		P488N-25		CUB4P25	4DP-5-254	GEM-4025	4TM-P25
C10	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

* Alternate Value

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5meg		DCV5					Loudness, Right Channel
B	5meg							Loudness, Left Channel
R2A	2meg		DT-189					Tone, Left Channel
B	2meg							Tone, Right Channel
R3	1meg		B-188					Balance

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	6.8meg	
R5	220K	
R6	560Ω	
R7	10K	
R8	68Ω	

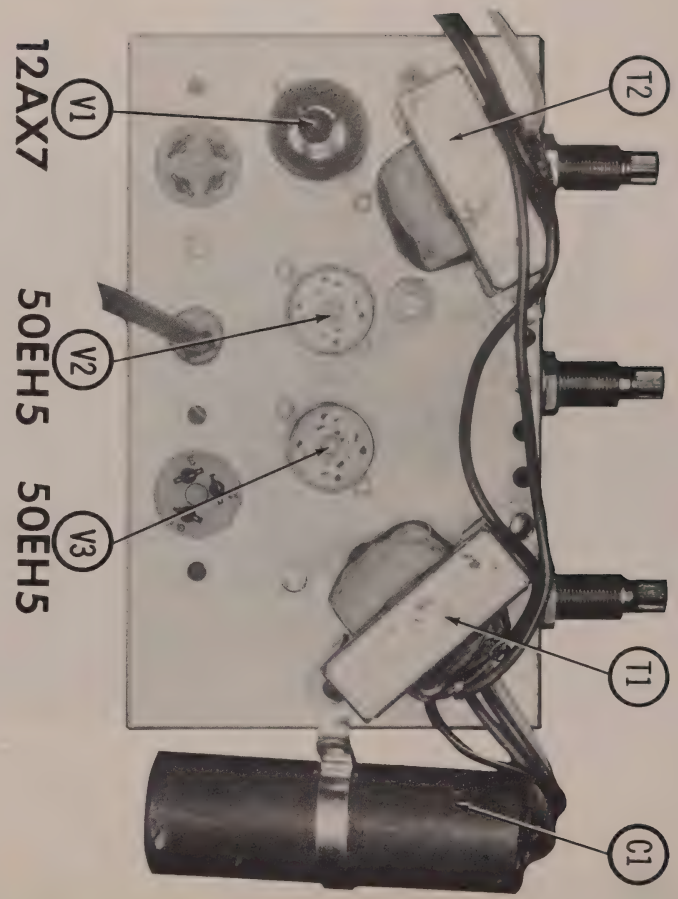
ITEM No.	RATING	REMARKS
R9	6.8meg	
R10	220K	
R11	560Ω	
R12	10K	
R13	2200Ω 1W	

ITEM No.	RATING	REMARKS
R14	150Ω 1W	
R15	33Ω 1W	
R16	33Ω 1W	
R17	68Ω	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3500Ω	8Ω	T-187							
		SEC. 2								
		55Ω								

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT) (cont)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	PRI. 3500Ω	SEC. 1 8Ω SEC. 2 55Ω	T-187							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA CORONADO PART No.	QUAM PART No.	NOTES
SP1	8"	PM	6-8Ω	78015460-6	8A2IZ8	
SP2	8"	PM	6-8Ω	78015460-6	8A2IZ8	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA CORONADO PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.070A	2F4 *	2E4 *	HA154 *	K200 *	SR200 *	* Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA CORONADO PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	P-106 13-T *	70TS 13T		13		A-44X		8TA4-S	N-8TA-S

* Alternate Type, used in some versions.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA CORONADO PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3	ST-075 (LP)		CRA-57 † or CRA-57D ♦	† Jewel ♦ Diamond For Part #P-106 Cartridge
	ST-250 (78 RPM)		CRA-57X † or CRA-57XD ♦	
		* W-204DS † ♦ or * W-204DD-1 ♦	* A-44X † or * A-44XSD † ♦ or * A-44XDD ♦	* Includes Cartridge for Part #13-T Cartridge

CABINETS & CABINET PARTS

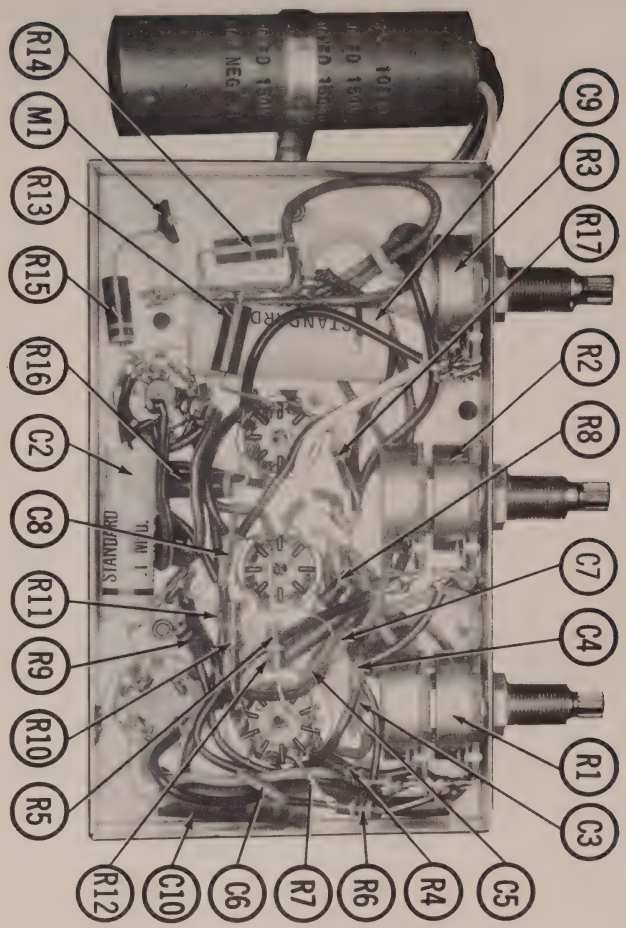
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

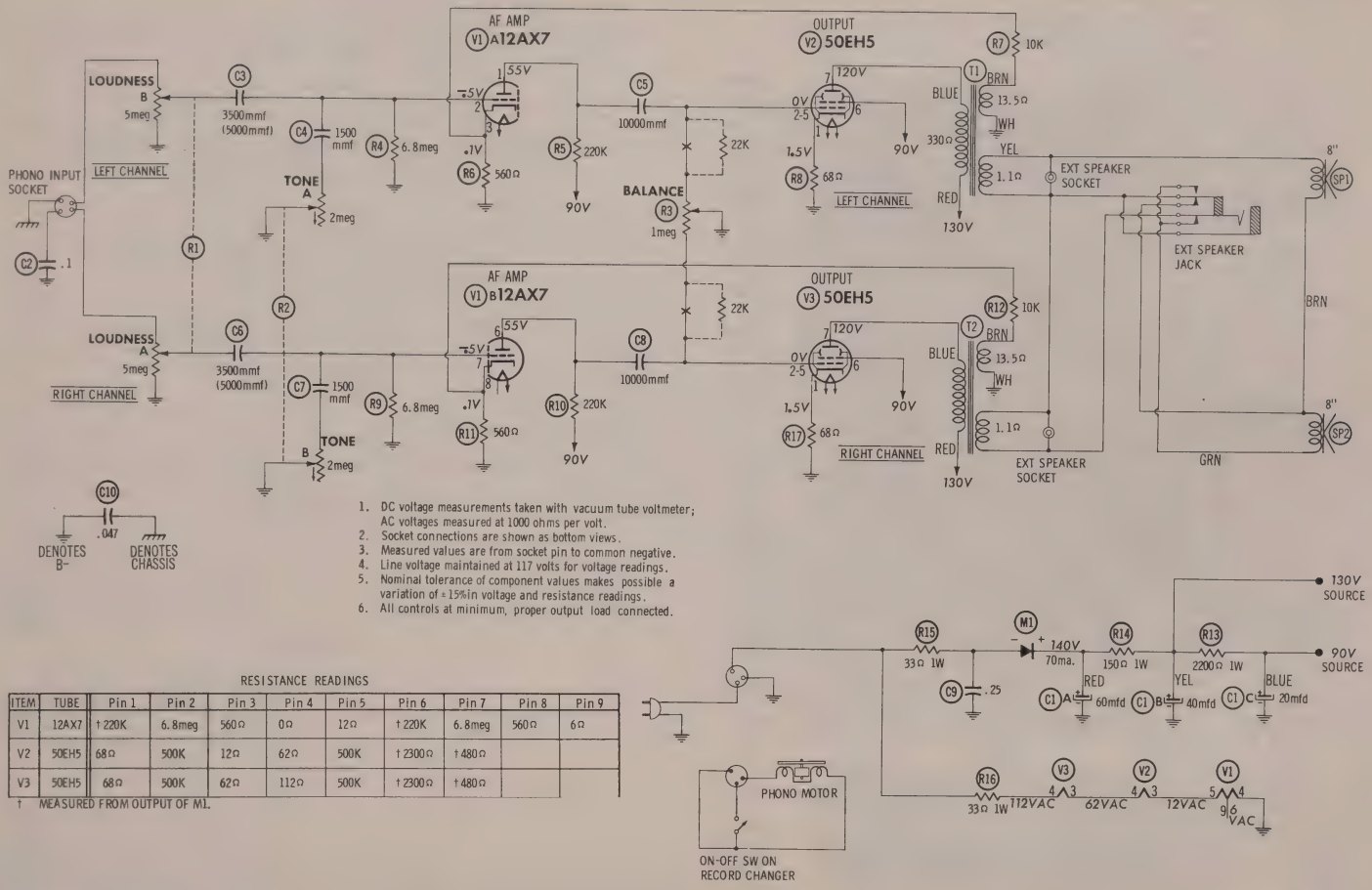
NAME	PART NO.	DESCRIPTION
Knob	R5925	Volume, Tone & Balance

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†220K	6.8meg	560Ω	0Ω	12Ω	†220K	6.8meg	560Ω	6Ω
V2	50EH5	68Ω	500K	12Ω	62Ω	500K	†2300Ω	†480Ω		
V3	50EH5	68Ω	500K	62Ω	112Ω	500K	†2300Ω	†480Ω		

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CORONADO MODELS
PH20-4051A, PH20-4052A

PHOTOFACT® Folder with CIRCUITRACE®

GENERAL ELECTRIC MODEL RP1150A

GENERAL ELECTRIC
MODEL RP1150A

GENERAL ELECTRIC
MODEL RP1150A

TRADE NAME	General Electric Model RP1150A
MANUFACTURER	General Electric Co., Product Service, Radio Receiver Dept., 869 Broad Street, Utica, N. Y.
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105 - 120 Volts AC, 60 Cycles RATING 55 Watts, .52 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER CH16 — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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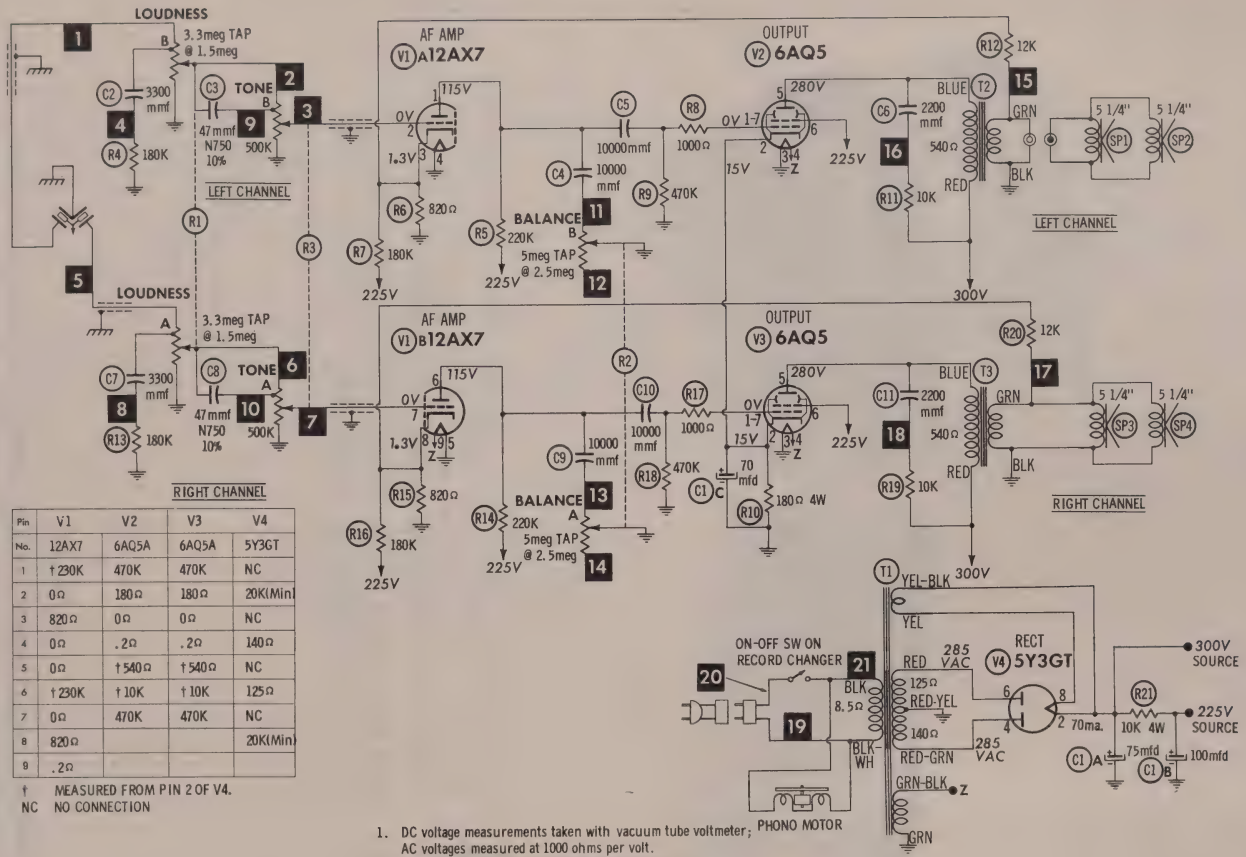

Pin No.	V1 12AX7	V2 6AQ5A	V3 6AQ5A	V4 5Y3GT
1	†230K	470K	470K	NC
2	0Ω	180Ω	180Ω	20K(Min)
3	820Ω	0Ω	0Ω	NC
4	0Ω	.2Ω	.2Ω	140Ω
5	0Ω	†540Ω	†540Ω	NC
6	†230K	†10K	†10K	125Ω
7	0Ω	470K	470K	NC
8	820Ω			20K(Min)
9	.2Ω			

† MEASURED FROM PIN 2 OF V4.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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GENERAL ELECTRIC MODEL RP1150A

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	V3	Right Channel Output	6AQ5A
V2	Left Channel Output	6AQ5A	V4	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	75	400	RS-2308					TVAS-3667 *	
B	100	400							
C	70	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C3	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C7	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C8	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	3.3meg 1.5meg Tap	½	RS-2304	BT-180 *				Loudness, Right Channel
B	3.3meg 1.5meg Tap	½		STR-180 *				Loudness, Left Channel
R2A	5meg 2.5meg Tap	½	RS-2306					Balance, Right Channel
B	5meg 2.5meg Tap	½						Balance, Left Channel
R3A	500K	½	RS-2305	B-60	AD47-500K-Z		FB55A	Tone, Right Channel
B	500K	½		SR-60	Not Req.		RU55A	Tone, Left Channel
C	Shaft			Not Req.	FS-3		CS3500	

* Do not use tap #1.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	180K	
R5	220K	
R6	820Ω	
R7	180K	
R8	1000Ω	
R9	470K	

ITEM No.	RATING	REMARKS
R10	180Ω 4W	#RS-2302
R11	10K	
R12	12K	
R13	180K	
R14	220K	
R15	820Ω	

ITEM No.	RATING	REMARKS
R16	180K	
R17	1000Ω	
R18	470K	
R19	10K	
R20	12K	
R21	10K 4W	#RS-2303

Ceneral Electric Part Number.

PRINTED BOARD

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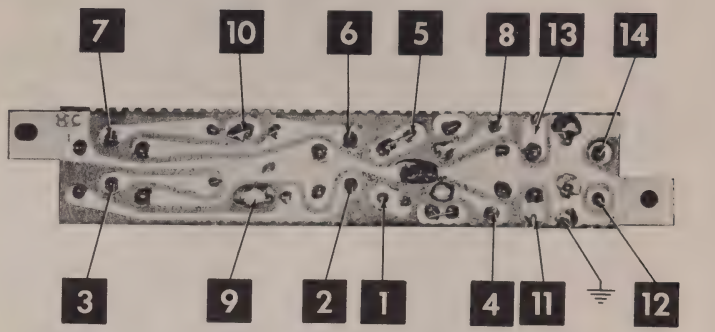
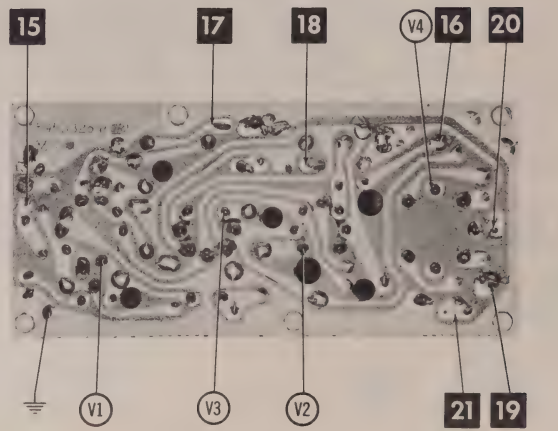
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED





PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .52A	570 VCT .070A	5V @ 2A	RS-2310	24R21U ①			P-8175 ①	24R21U ①	R-9A ①
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 1.2A									

① Drill New Mounting Holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9800Ω	1-2Ω	RS-2309	24S11	A-3019	AU-604	A-3823	24S11	S-53X	
T3	9800Ω	1-2Ω	RS-2309	24S11	A-3019	AU-604	A-3823	24S11	S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	RB-1046	52A21	
SP2	5 1/4"	PM	3-4Ω	RB-1046	52A21	
SP3	5 1/4"	PM	3-4Ω	RB-1046	52A21	
SP4	5 1/4"	PM	3-4Ω	RB-1046	52A21	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	G. E. PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	RS-1651	13T		13		A-44X		10T2-S	

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	G. E. PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	(Part of M1)	* W-204DS † or * W-204DD ♦	* A-44X † or * A-44XSD †♦ or * A-44XDD ♦	† Jewel ♦ Diamond * Includes Cartridge

CABINETS & CABINET PARTS

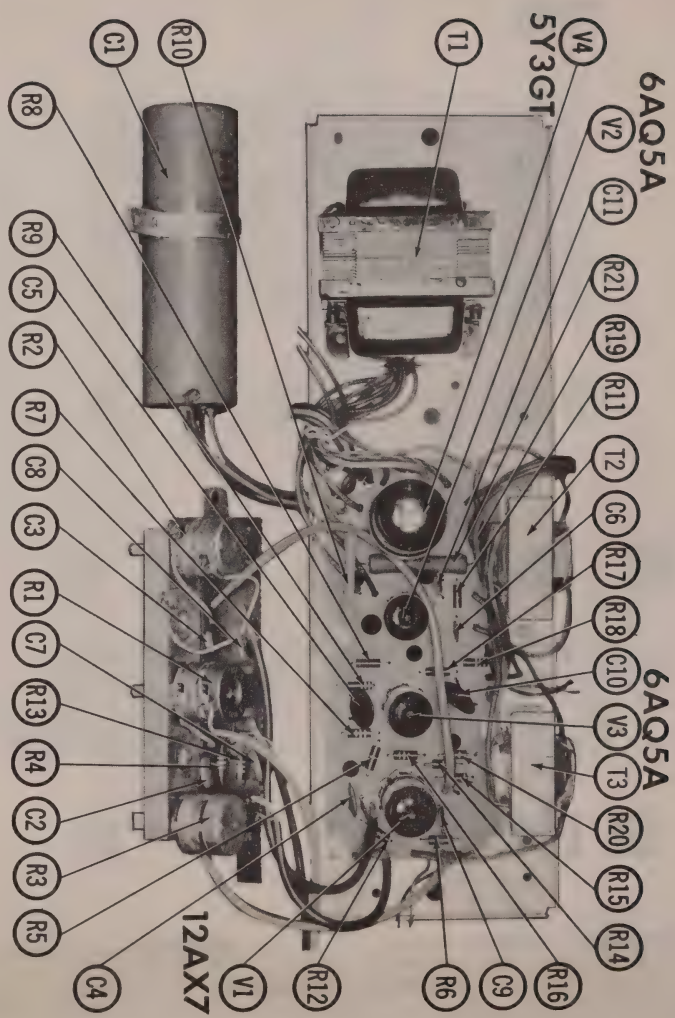
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knobs	RS-2296	Loudness, Balance, Tone

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—TOP VIEW



PHOTOFACT® Folder

HARMAN-KARDON
MODEL A-220

HARMAN-KARDON
MODEL A-220

HARMAN-KARDON
MODEL A-220

TRADE NAME	Harman-Kardon Model A-220 (The Lute)
MANUFACTURER	Harman-Kardon, Inc., 520 Main Street, Westbury, L. I., N. Y.
TYPE SET	AC Operated 8 Tube Stereo Audio Amplifier
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 78 Watts, .76 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JV998

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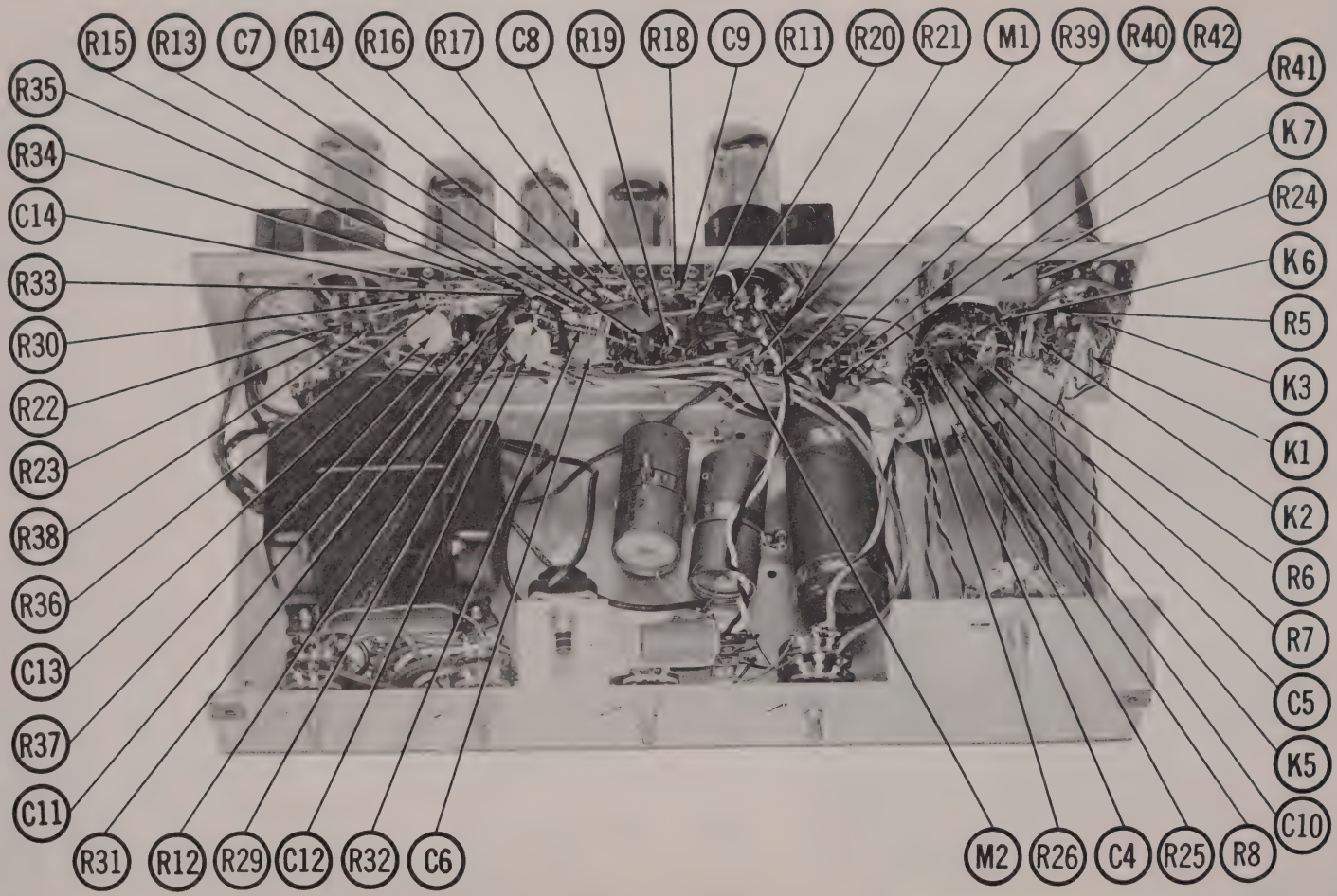


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel Preamp. - Right Channel Preamp.	ECC83/12AX7
V2	Left Channel AF Amp. - Right Channel AF Amp.	ECC83/12AX7
V3	Left Channel AF Amp. - Right Channel AF Amp.	ECC83/12AX7
V4	Left Channel Phase Inv. - Right Channel Phase Inv.	ECC82/12AU7
V5	Left Channel Output	7408
V6	Left Channel Output	7408
V7	Right Channel Output	7408
V8	Right Channel Output	7408

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	100	200	JE3083447	PRS1595	BRI0035	TC1265	TD-100-450	TVA-1718	
C2	100	200	JE3083447	PRS1595	BRI0035	TC1265	TD-100-450	TVA-1718	
C3A	50	350	JE3083402	PR4-450				TVAS-4632*	
B	40	350							
C	20	350							
D	50	50							
C4	50	12		PRS1265	BBR50-25	TT15X50	TD-50-25	TVA-1206	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C6	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C7	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	47 N3300					*		
C10	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C11	20000		BPD-01	DD-203	BYB6S2	CCD-203	B-110	5HK-S20
C12	20000		BPD-01	DD-203	BYB6S2	CCD-203	B-110	5HK-S20
C13	20000		BPD-01	DD-203	BYB6S2	CCD-203	B-110	5HK-S20
C14	47 N3300					*		

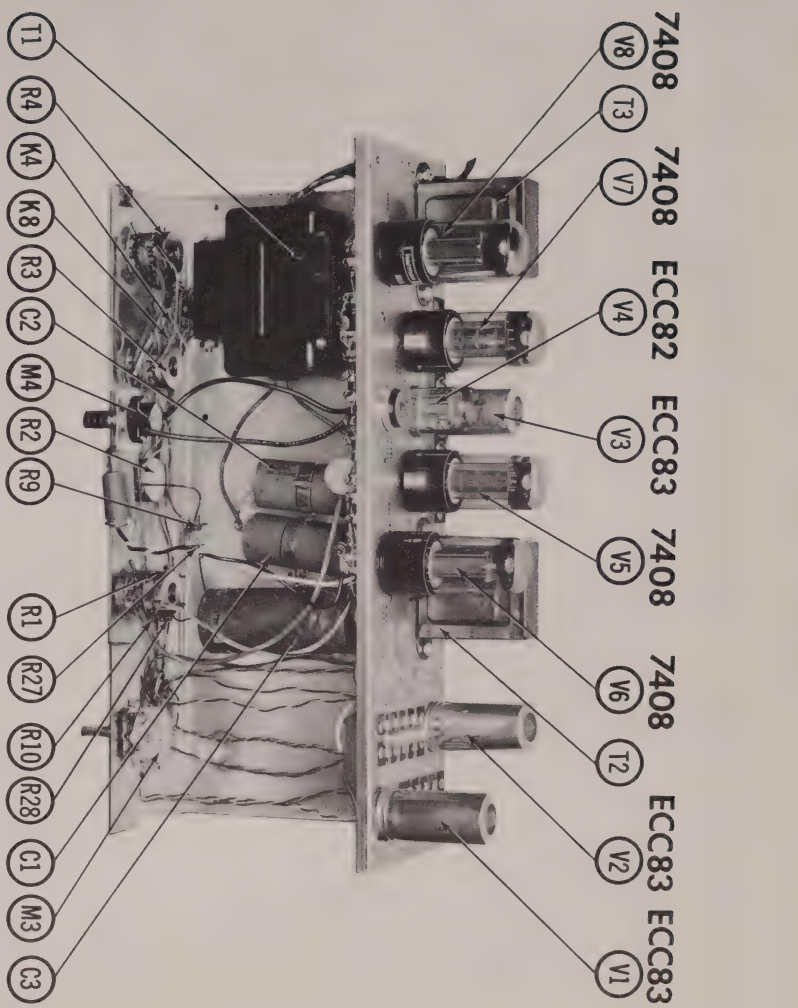
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg *		RV3113436					Loudness, Left Channel
B	1meg *							Loudness, Right Channel
R2A	100K		RV3113608A	B-40	A47-100K-S	Q11-128	U41	Balance, Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K		RVCOM3437	B-60	AD47-500K-Z		FA55A	Bass, Left Channel
B	500K			SR-60	Not Req.		RU55A	Bass, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R4A	500K		RVCOM3437	B-60	AD47-500K-Z		FA55A	Treble, Left Channel
B	500K			SR-60	Not Req.		RU55A	Treble, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	

* Taps @ 300K and 600K.
Note 1. Some versions may use Part #RV3113435.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	22K	
R6	1meg	
R7	100K	
R8	1000Ω	
R9	68K	
R10	27K	
R11	100K 1W	
R12	330K	
R13	1meg	
R14	18K	
R15	2700Ω	
R16	15K	
R17	220Ω	

ITEM No.	RATING	REMARKS
R18	68K	
R19	470K	
R20	470K	
R21	2200Ω	
R22	33Ω	
R23	33Ω	
R24	22K	
R25	1meg	
R26	100K	
R27	68K	
R28	27K	
R29	330K	
R30	100K 1W	

ITEM No.	RATING	REMARKS
R31	1meg	
R32	18K	
R33	2700Ω	
R34	15K	
R35	220Ω	
R36	68K	
R37	470K	
R38	470K	
R39	10Ω	
R40	1000Ω 1W	
R41	1000Ω 1W	
R42	6800Ω	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA	
K1	Tuner Input Comp.	47mmf, 47K, 470K	PCCOM3639	Sprague	TC-34
K2	Phono Input Comp.	10mmf, 50000mmf, 47K, 100K, 1, 2meg 3, 3meg	PCCOM3638	Sprague	TC-33
K3	Preamp. Plate	3000mmf, 10000mmf, 20000mmf, 22K, 100K, 330K	PCCOM3637		
K4	Tone Comp.	750mmf, 3000mmf, 3400mmf, 15000mmf, 27K, 120K	PC2492902	Sprague	TC-22
K5	Tuner Input Comp.	47mmf, 47K, 470K	PCCOM3639	Sprague	TC-34
K6	Phono Input Comp.	10mmf, 50000mmf, 47K, 100K, 1, 2meg, 3, 3meg	PCCOM3638	Sprague	TC-33
K7	Preamp. Plate	3000mmf, 10000mmf, 20000mmf, 22K, 100K, 330K	PCCOM3637		
K8	Tone Comp.	750mmf, 3000mmf, 3400mmf, 15000mmf, 27K, 120K	PC2492902	Sprague	TC-22

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ .76A	120V Ⓐ .600A	6.3V Ⓐ 2.5A	FT3083446-C①						

① Alternate Part #FT3083446

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7500Ω CT	16Ω Tap Ⓐ 8Ω	FT3083445-B ①							
T3	7500Ω CT	16Ω Tap Ⓐ 8Ω	FT3083445-B ①							

① Alternate Part #FT-3083445.

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Harman-Kardon PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.160A	Z3083444 *	5E4 *	RE504 *	40K *	SR500 *	* Silicon Type
M2	.160A	Z3083444 *	5E4 *	RE504 *	40K *	SR500 *	

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M3	Switch	ER3113480	Function/ Mode
M4	Switch	EP3113479	Off-On, Pushbutton Type

CABINETS & CABINET PARTS

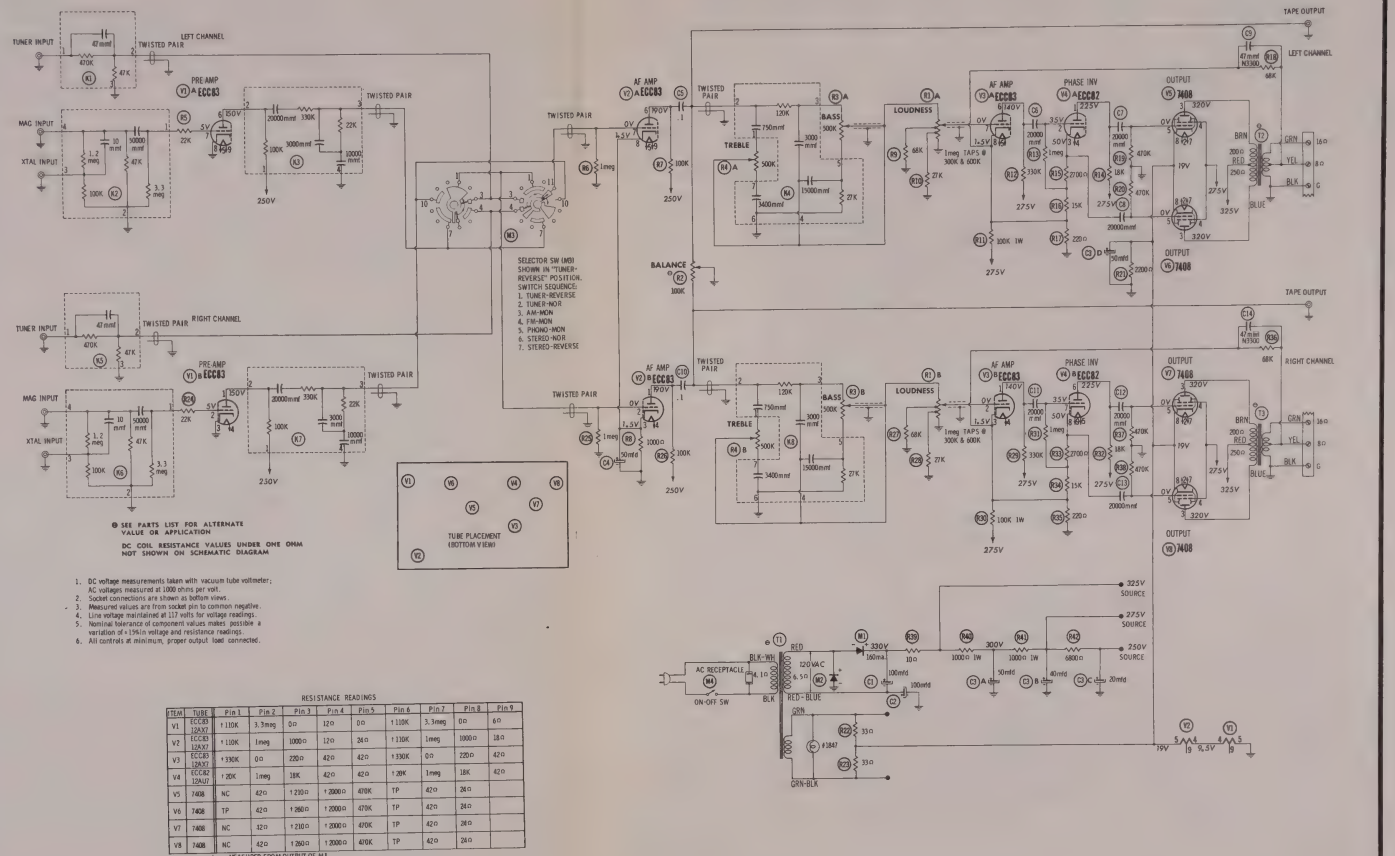
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knobs	PCOM3468	Treble, Bass, Balance, Loudness, Function

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 (12AX7)	↑110K	3.3meg	0Ω	12Ω	0Ω	↑110K	3.3meg	0Ω	6Ω
V2	ECC83 (12AX7)	↑110K	1meg	1000Ω	12Ω	2Ω	↑110K	1meg	1000Ω	18Ω
V3	ECC83 (12AX7)	↑330K	0Ω	220Ω	42Ω	42Ω	↑330K	0Ω	220Ω	42Ω
V4	ECC83 (12AU7)	↑20K	1meg	18K	42Ω	42Ω	↑20K	1meg	18K	42Ω
V5	7408	NC	42Ω	↑210Ω	↑2000Ω	470K	TP	42Ω	24Ω	
V6	7408	TP	42Ω	↑260Ω	↑2000Ω	470K	TP	42Ω	24Ω	
V7	7408	NC	42Ω	↑210Ω	↑2000Ω	470K	TP	42Ω	24Ω	
V8	7408	NC	42Ω	↑260Ω	↑2000Ω	470K	TP	42Ω	24Ω	

↑ MEASURED FROM OUTPUT OF M.L.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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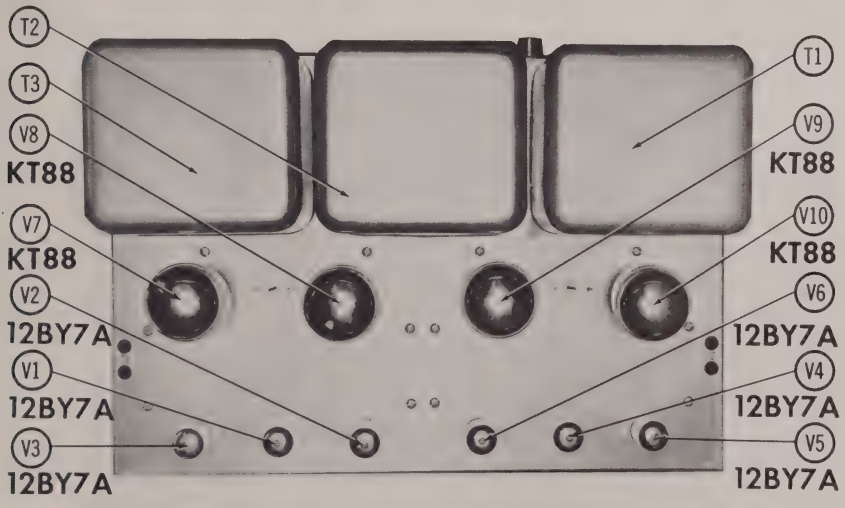
HARMAN-KARDON
MODEL A-220

PHOTOFACT® Folder

HARMAN-KARDON
MODEL Citation II

HARMAN-KARDON
MODEL Citation II

TRADE NAME	Harman-Kardon Model Citation II
MANUFACTURER	Harman-Kardon, Inc., 520 Main Street, Westbury, L. I., N. Y.
TYPE SET	AC Operated 10 Tube Stereo Amplifier
POWER SUPPLY	110 - 125 Volts AC, 60 Cycles · RATING 300 Watts, 2.8 Amp. @117 Volts AC



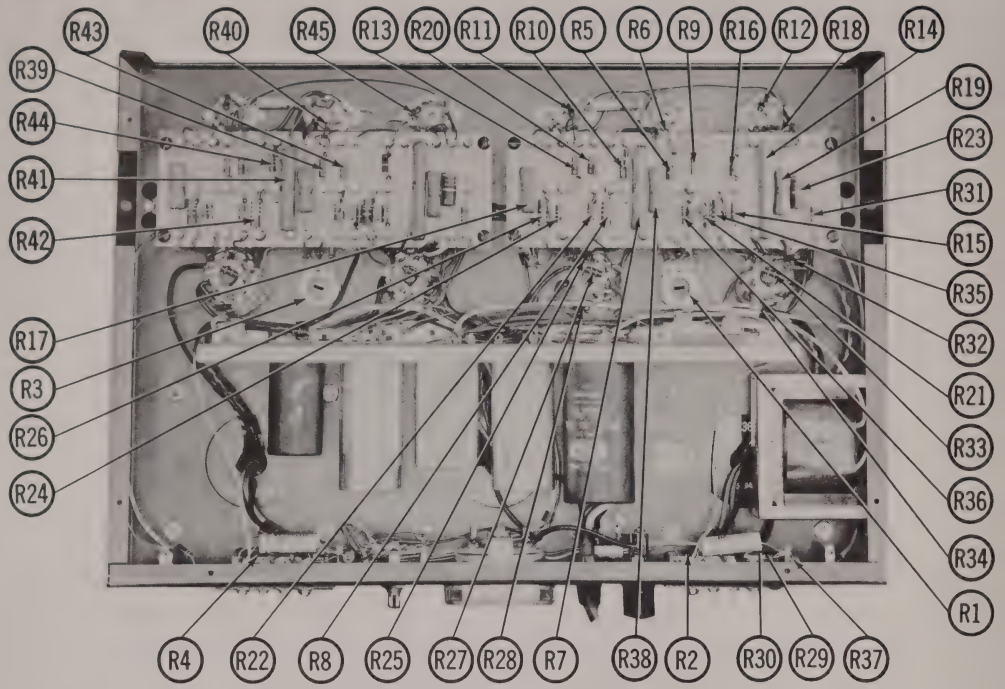
HARMAN-KARDON
MODEL Citation II

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

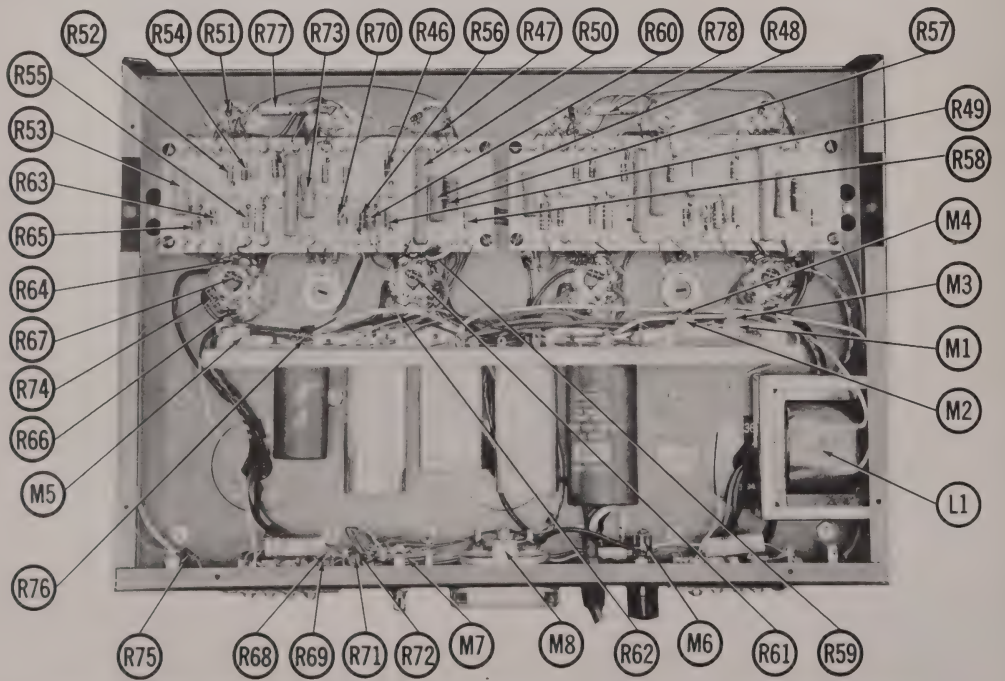
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KV001

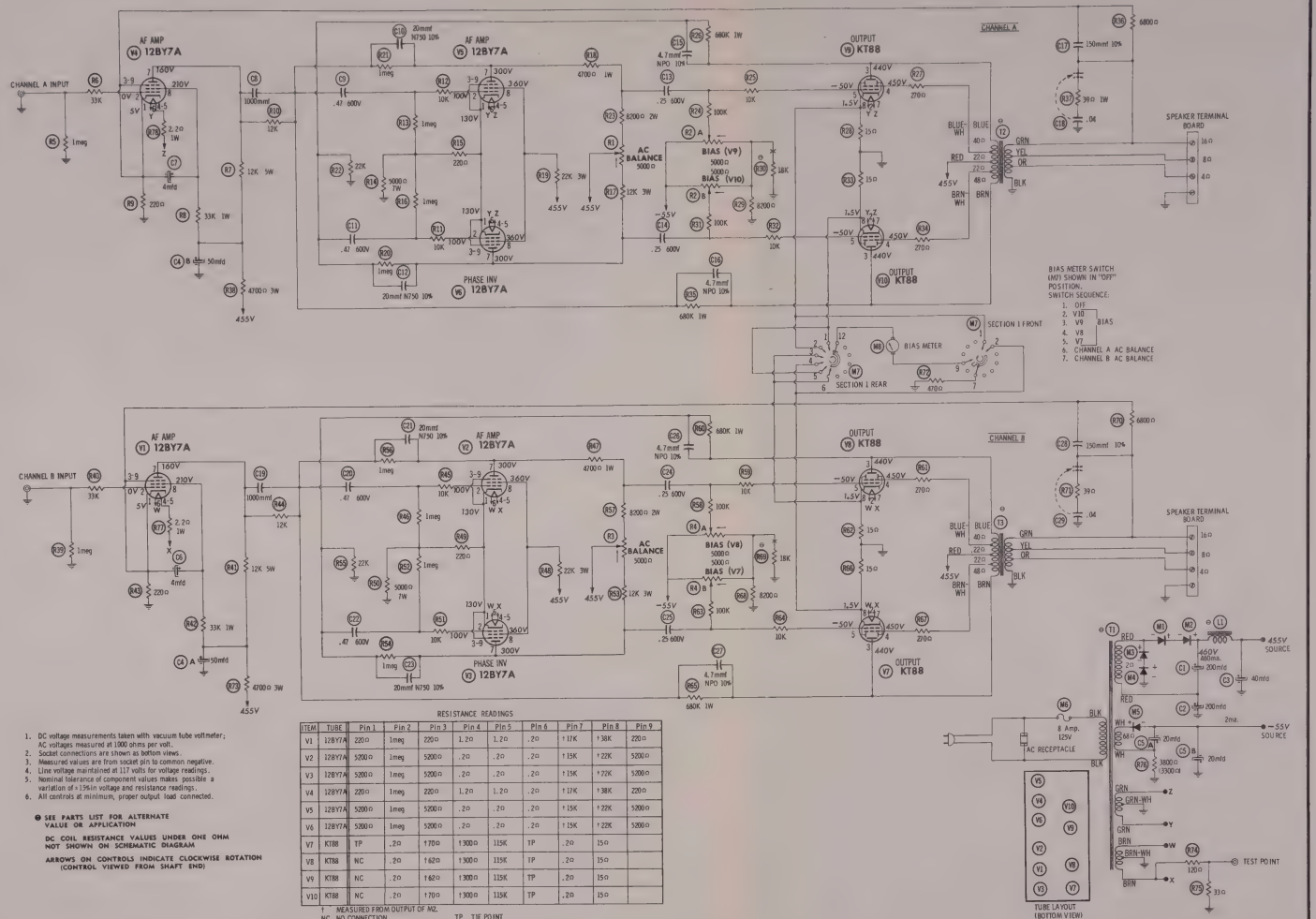
SET495 FOLDER 11



CHASSIS BOTTOM VIEW - RESISTOR IDENT. (R1-R45)



CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR & MISC. IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BY7A	220Ω	1meg	220Ω	1.2Ω	1.2Ω	.2Ω	†17K	†38K	220Ω
V2	12BY7A	5200Ω	1meg	5200Ω	.2Ω	.2Ω	.2Ω	†15K	†22K	5200Ω
V3	12BY7A	5200Ω	1meg	5200Ω	.2Ω	.2Ω	.2Ω	†15K	†22K	5200Ω
V4	12BY7A	220Ω	1meg	220Ω	1.2Ω	1.2Ω	.2Ω	†17K	†38K	220Ω
V5	12BY7A	5200Ω	1meg	5200Ω	.2Ω	.2Ω	.2Ω	†15K	†22K	5200Ω
V6	12BY7A	5200Ω	1meg	5200Ω	.2Ω	.2Ω	.2Ω	†15K	†22K	5200Ω
V7	KT88	TP	.2Ω	†70Ω	†300Ω	115K	TP	.2Ω	15Ω	
V8	KT88	NC	.2Ω	†62Ω	†300Ω	115K	TP	.2Ω	15Ω	
V9	KT88	NC	.2Ω	†62Ω	†300Ω	115K	TP	.2Ω	15Ω	
V10	KT88	NC	.2Ω	†70Ω	†300Ω	115K	TP	.2Ω	15Ω	

† MEASURED FROM OUTPUT OF MZ.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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HARMAN-KARDON
MODEL Citation II

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel B AF Amp.	12BY7A	V6	Channel A Phase Inv.	12BY7A
V2	Channel B AF Amp.	12BY7A	V7	Channel B Output	KT88
V3	Channel B Phase Inv.	12BY7A	V8	Channel B Output	KT88
V4	Channel A AF Amp.	12BY7A	V9	Channel A Output	KT88
V5	Channel A AF Amp.	12BY7A	V10	Channel A Output	KT88

ELECTROLYTIC CAPACITORS

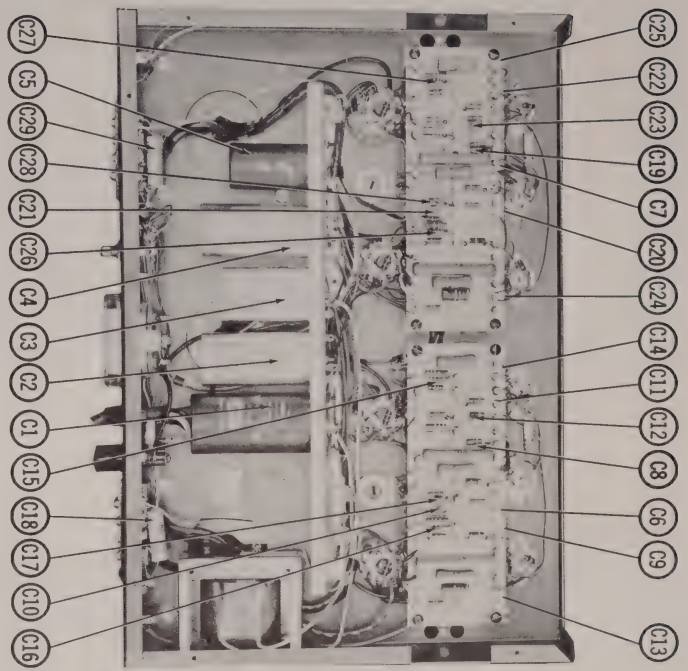
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	200	250	JE3273851	AFHS1-37-30	XA0318	FP126	TMS-75	TVL-1547	
C2	200	250	JE3273682	AFHS1-37-30	XA0318	FP126	TMS-75	TVL-1547	
C3	40	525	JE3273681			FP176		TVL-1820	
C4A	■50	450	JE3273783	AFH2-59	XB0455	FP240	TMD-56	TVL-2767	
B	▲50	450							
C5A	▲20	150	JE3273683	AFH2-08	B0090	FP208	TMD-6	TVL-2415	
B	■20	150							
C6	4	450	JE3273784	PRS1710	BR445	TC70	TD4-450	TVA-1702	
C7	4	450	JE3273784	PRS1710	BR445	TC70	TD4-450	TVA-1702	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	.47 600V		P688N-47		CUB6P47		GEM-6047	6TM-P5
C10	20 N750 10%		N750-DI 20	DTN-20	C10Q2U	CCTN-220	CN7-420	10TCU-Q20
C11	.47 600V		P688N-47		CUB6P47		GEM-6047	6TM-P5
C12	20 N750 10%		N750-DI 20	DTN-20	C10Q2U	CCTN-220	CN7-420	10TCU-Q20
C13	.25 600V		P688N-25		CUB6P25	6DP-5-254	GEM-6025	6TM-P25
C14	.25 600V		P688N-25		CUB6P25	6DP-5-254	GEM-6025	
C15	4.7 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C16	4.7 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C17	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C18	.04 200V		P288N-04	DD-403	CUB6S4	4DP-3-403	GEM-414	4TM-S4
C19	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C20	.47 600V		P688N-47		CUB6P47		GEM-6047	6TM-P5
C21	20 N750 10%		N750-DI 20	DTN-20	C10Q2U	CCTN-220	CN7-420	10TCU-Q20
C22	.47 600V		P688N-47		CUB6P47		GEM-6047	6TM-P5
C23	20 N750 10%		N750-DI 20	DTN-20	C10Q2U	CCTN-220	CN7-420	10TCU-Q20
C24	.25 600V		P688N-25		CUB6P25	6DP-5-254	GEM-6025	6TM-P25
C25	.25 600V		P688N-25		CUB6P25	6DP-5-254	GEM-6025	6TM-P25
C26	4.7 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C27	4.7 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C28	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C29	.04 200V		P288N-04	DD-403	CUB6S4	4DP-3-403	GEM-414	4TM-S4

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5000Ω		RV3273908			B11-114	TA53L	AC Balance, Channel A
B	Shaft					TM4	Not Req.	
R2A	5000Ω		RV3273743					Bias (V9)
B	5000Ω							Bias (V10)
R3A	5000Ω		RV3273908			B11-114		AC Balance, Channel B
B	Shaft					TM4		
R4A	5000Ω		RV3273743					Bias (V8)
B	5000Ω							Bias (V7)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	1meg	
R6	33K	
R7	12K 5W	
R8	33K 1W	
R9	220Ω	
R10	12K	
R11	10K	
R12	10K	
R13	1meg	
R14	5000Ω 7W	
R15	220Ω	
R16	1meg	
R17	12K 3W	
R18	4700Ω 1W	
R19	22K 3W	
R20	1meg	
R21	1meg	
R22	22K	
R23	8200Ω 2W	
R24	100K	
R25	10K	
R26	680K 1W	
R27	270Ω	
R28	15Ω	
R29	8200Ω	

ITEM No.	RATING	REMARKS
R30	18K	Note 1
R31	100K	
R32	10K	
R33	15Ω	
R34	270Ω	
R35	680K 1W	
R36	6800Ω	
R37	39Ω 1W	
R38	4700Ω 3W	
R39	1meg	
R40	33K	
R41	12K 5W	
R42	33K 1W	
R43	220Ω	
R44	12K	
R45	10K	
R46	1meg	
R47	4700Ω 1W	
R48	22K 3W	
R49	220Ω	
R50	5000Ω 7W	
R51	10K	
R52	1meg	
R53	12K 3W	
R54	1meg	

ITEM No.	RATING	REMARKS
R55	22K	
R56	1meg	
R57	8200Ω 2W	
R58	100K	
R59	10K	
R60	680K 1W	
R61	270Ω	
R62	15Ω	
R63	100K	
R64	10K	
R65	680K 1W	
R66	15Ω	
R67	270Ω	
R68	8200Ω	
R69	18K	Note 1
R70	6800Ω	
R71	39Ω	
R72	470Ω	
R73	4700Ω 3W	
R74	120Ω	
R75	33Ω	
R76	3800Ω	(3300Ω) *
R77	2.2Ω 1W	
R78	2.2Ω 1W	

Note 1. Not used in some versions.
* Alternate Value.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L1	.460A	11Ω	.7HY	FC3273672A ①				C-2328②		

① Alternate Part #FC3273672.
② Drill New Mounting Holes.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ 2.8A	160V@ 1.7A (AC)	6.3VCT @ 3.8A	FT3273670A						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V@ 3.8A	70V@ .002A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	3200Ω CT Tap@ 400Ω CT	16Ω Tap @ 8Ω, 4Ω	FT3273671A①							
T3	3200Ω CT Tap@ 400Ω CT	16Ω Tap @ 8Ω, 4Ω	FT3273671A①							

① Alternate Part #FT3273671.

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Harman-Kardon PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.460A	ZCOM3679 *	SD-94A *	RE504 *	40K *	SR-500 *	* Silicon Type
M2	.460A	ZCOM3679 *	SD-94A *	RE504 *	40K *	SR-500 *	♦ Selenium Type
M3	.460A	ZCOM3679 *	SD-94A *	RE504 *	40K *	SR-500 *	
M4	.460A	ZCOM3679 *	SD-94A *	RE504 *	40K *	SR500 *	
M5	.002A	Z3273690 ♦	D-5410 ♦	1159 ♦	10 ♦		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Harman-Kardon PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M6	3AG	8A 125V	ZCOM3715		312008 (3AG 8A 125V)	342001	GLH 8	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M7	Switch	ER3273909	Meter
M8	Meter	M3273850	Includes Mounting Bracket and Nuts.

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

ADJUSTMENTS

BIAS ADJUSTMENT

1. Set Meter switch to V10 position. Make sure no signal is applied.
2. Adjust V10 Bias control until meter pointer coincides with Bias marker on meter. Repeat adjustments for V9, V8 and V7.
3. Repeat this procedure until no meter movement is noted as the switch is rotated from one position to another.

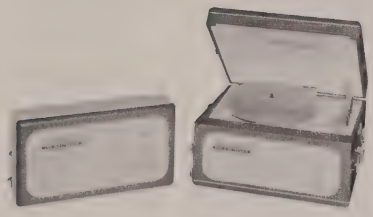
A.C. BALANCE ADJUSTMENT

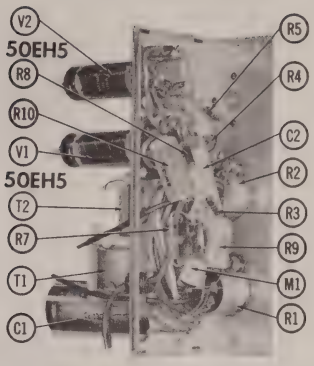
1. Connect a 16 ohm 20 watt resistor across the 16 ohm terminals of Channel A speaker terminal strip. Connect a phono patch cord from the Test Signal jack to the Channel A input jack.
2. Rotate the Meter switch to the Channel A A.C. Balance position.
3. Adjust the Channel A Balance control until the meter pointer coincides with the Balance marker on the meter.
4. Move the patch cord from Channel A input to Channel B input and repeat above adjustments for Channel B.

PHOTOFACT® Folder

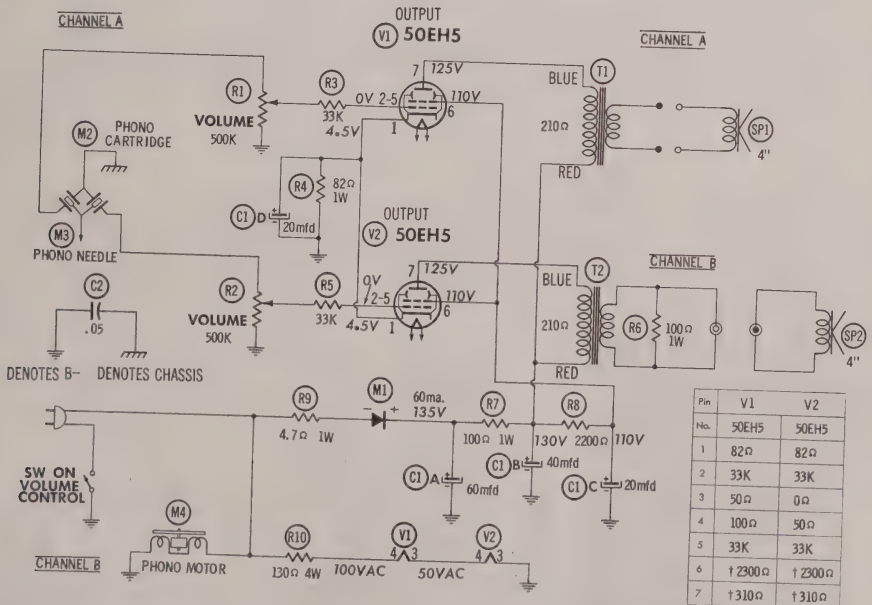
HARMONY MODEL 208

HARMONY MODEL 208





TRADE NAME	Harmony Model 208
MANUFACTURER	CBS Electronics, 100 Endicott Street, Danvers, Mass.
TYPE SET	AC Operated 2 Tube Stereo Phono Amplifier With 3 Speed Manual Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 42 Watts, .44 Amp. @117 Volts AC



Pin No.	V1 50EH5	V2 50EH5
1	82Ω	82Ω
2	33K	33K
3	50Ω	0Ω
4	100Ω	50Ω
5	33K	33K
6	†2300Ω	†2300Ω
7	†310Ω	†310Ω

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SET 495 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A Output	50EH5	V2	Channel B Output	50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	HARMONY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	11B744	PR4-200	BBRT42215	TCT3114	TDLT-3	TVA-3448	
B	40	150			BR6015	TC68	TD-50-150	TVA-1415	
C	20	150							
D	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HARMONY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	9B612	B-60-S	A47-500K-Z	Q13-133	U48	Volume A
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	500K	½	9B570	B-60	A47-500K-Z	Q13-133	U48	Volume B
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	33K	
R4	82Ω 1W	
R5	33K	

ITEM No.	RATING	REMARKS
R6	100Ω 1W	
R7	100Ω 1W	
R8	2200Ω	

ITEM No.	RATING	REMARKS
R9	47Ω 1W	#16B447①
R10	130Ω 4W	#16B432

① Fuse Type
◆ Harmony Part Number.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HARMONY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3000Ω	3-4Ω	3B241	26S58	A-3025①	AU-605①	A-3332①	26S58	S-12X①	
T2	3000Ω	3-4Ω	3B241	26S58	A-3025①	AU-605①	A-3332①	26S58	S-12X①	

① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HARMONY PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	1B102	4A1	
SP2	4"	PM	3-4Ω	1B102	4A1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	HARMONY PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.060A	10B615 *	2E4 *	HA154 *	K200 *	SR200 *	* Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	HARMONY PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	ST-40	76TS TB		96					

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	HARMONY PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	(78 RPM)		CRA-57 † or CRA-57D ♦	† Jewel ♦ Diamond
	(LP)		CRA-57X † or CRA-57XD ♦	

MISCELLANEOUS

ITEM No.	PART NAME	HARMONY PART No.	NOTES
M4	Motor	6B315	3 Speed (Tan Knob)
	Motor	6B313	3 Speed (Ivory Knob)
	Tone Arm	4B119	Brown
	Tone Arm	4B120	Grey
	Idler Wheel		Walsco Part No. 1433

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8B457	Volume (Grey)
Knob	8B520	Volume (Tan)
Cabinet	17B870	Brown & White
Cabinet	17B871	Grey & White

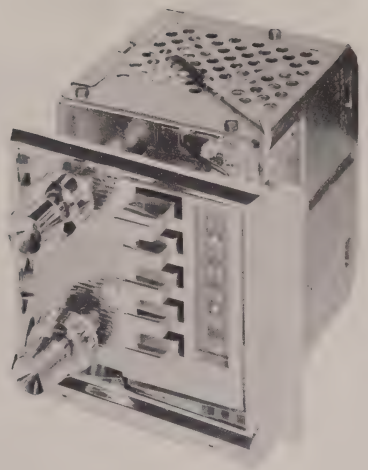
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder with CIRCUITRACE®

MERCURY MODELS 04BM-1 (COMF-18805), 04BM-2 (COMF-18806)

MERCURY MODELS 04BM-1
(COMF-18805), 04BM-2 (COMF-18806)



TRADE NAME	Mercury Models 04BM-1(COMF-18805), 04BM-2 (COMF-18806) For 1960 Mercury Automobiles
MANUFACTURER	Bendix Radio Div., Bendix Aviation Corp., Baltimore 4, Maryland
TYPE SET	Battery Operated 4 Tube, 2 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	535 — 1605KC RATING 1.2 Amp. @ 12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #8721, 8722
WALSCO #2519
A8, A9, A10 see Fig 2.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	262.5MC (400~ Mod.)	High end stop.	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Thru dummy to antenna receptacle. (Fig. 1)	1605KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuning cores or coils have been replaced or tuner has been tampered with. If necessary, back tuning cores (A8, A9 and A10) out of coils but not out of coil forms. Repeat Step 2.					
3.	Thru dummy to antenna receptacle. (Fig. 1)	1000KC	Tuner carriage .380 inches from high freq. end stop.	DC probe to point (A). Common to chassis.	A8, A9 A10	Adjust for maximum deflection. Repeat steps 2 and 3 until no further improvement is noted. Cement cores.
	With radio installed in car and antenna fully extended, tune in a weak station near 1000 KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station.
2. Pull out buttons; press in firmly.
3. Repeat for remaining buttons.

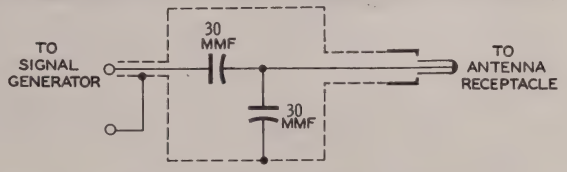


FIG. 1

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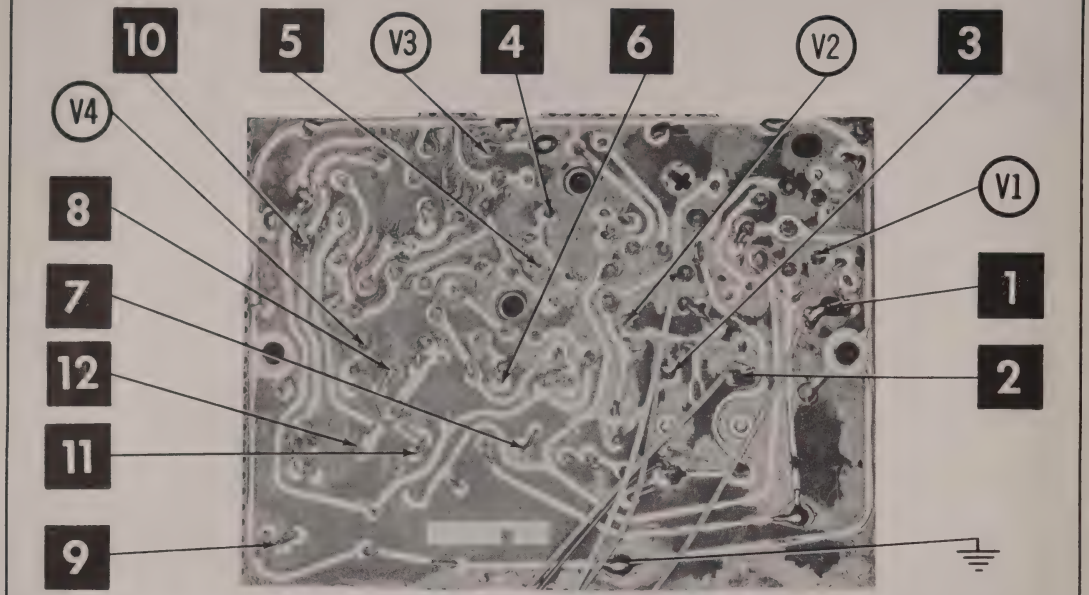
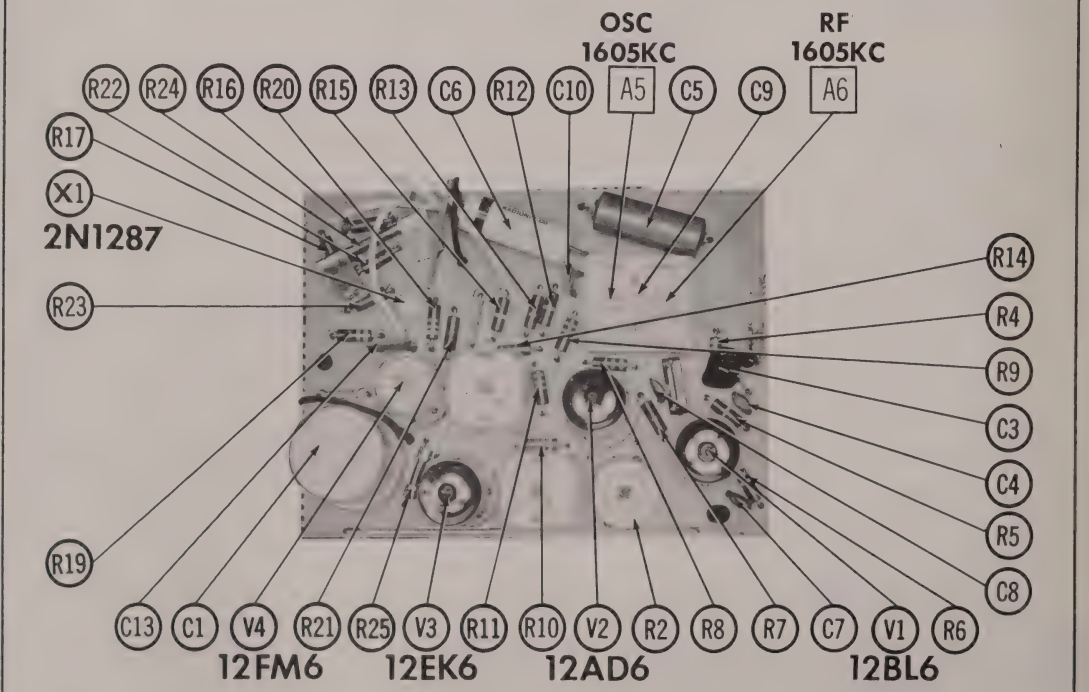
SET 495 FOLDER 13



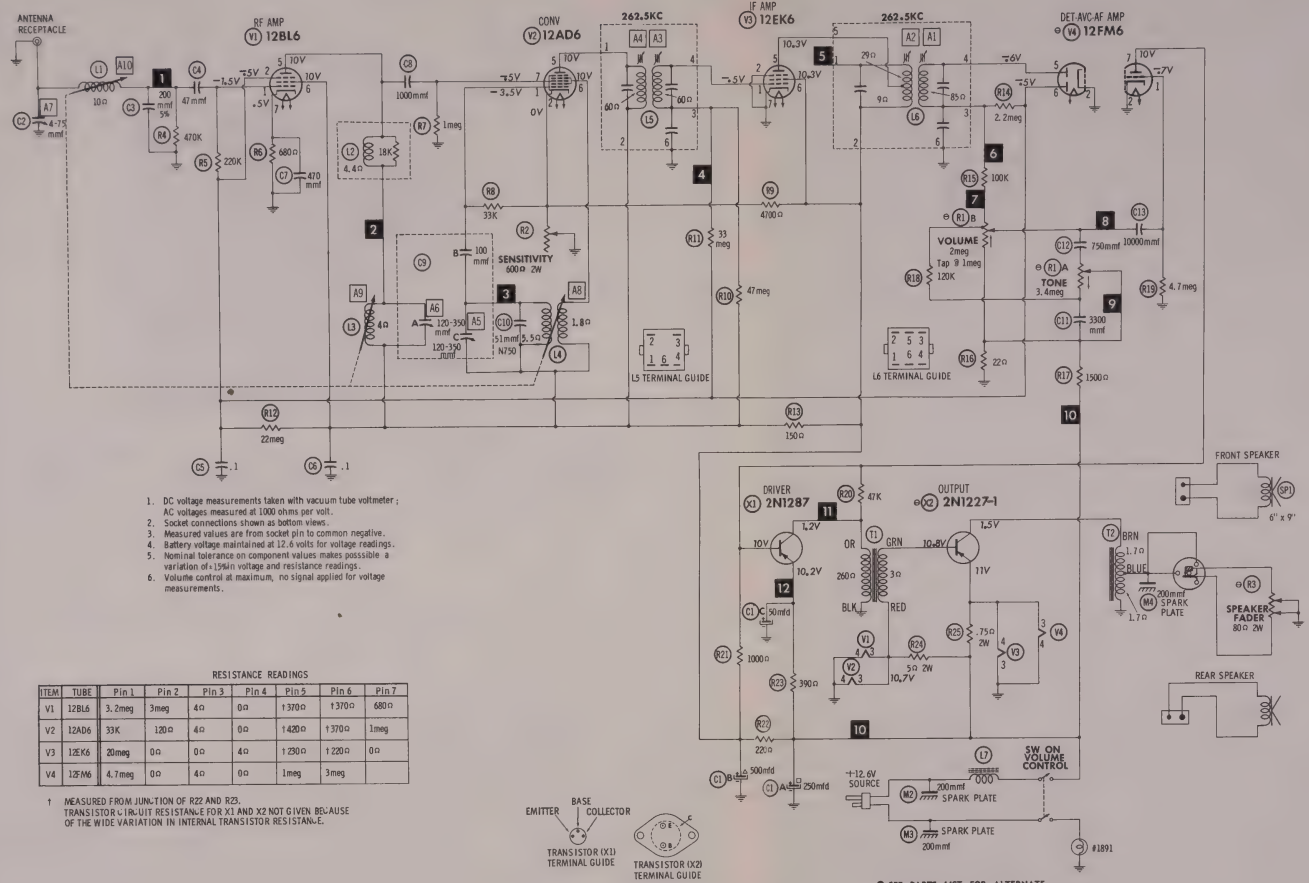
A Howard W. Sams CIRCUITRACE* Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PRINTED BOARD



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	3.2meg	3meg	4Ω	0Ω	†370Ω	†370Ω	680Ω
V2	12AD6	33K	120Ω	4Ω	0Ω	†420Ω	†370Ω	1meg
V3	12EK6	20meg	0Ω	0Ω	4Ω	†230Ω	†220Ω	0Ω
V4	12FM6	4.7meg	0Ω	4Ω	0Ω	1meg	3meg	

† MEASURED FROM JUNCTION OF R22 AND R23. TRANSISTOR CIRCUIT RESISTANCE FOR X1 AND X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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MERCURY MODELS 04BM-1 (COMF-18805), 04BM-2 (COMF-18806)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	RF Amplifier	12BL6
V2	Converter	12AD6
V3	IF Amplifier	12EK6
V4	Det. -AVC-AF Amp.	12FM6 (12FK6) *

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1287	Driver					PNP
X2	2N1227-1*	Output	2N1227				PNP Note 1

* Some versions may use 2N1283A in this application.
Note 1. When replacing, apply silicone grease to both sides of insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	BENDIX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	500	16	220353-17	PWH3-00-93	C0005	PWP300.3		PCLS-3026.5*	
B	250	16							
C	50	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	4-75	#219083-1				462		
C3	200 5%		1469-0002	TCZ-200	22R5T2	CM-19B-201J	MCE237	MS-320
C4	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C5	.1 100V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C6	.1 100V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C7	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D1

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C9A	120-350							
B	100	#219092-14	NPO-DI 100	TCZ-100	C10T1U	CCTO-101	CNO-310	10TCC-T10
C	120-350							
C10	51 N750		N750-DI 47	DTN-47	C10Q51U	CCTN-470	CN7-447	10TCU-Q45
C11	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C12	750		DI-750	DD-751	L10T75	CCD-751	GP375	10TS-T75
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

Bendix Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	3.4meg		2090405-6	F1-78				Tone Note 1
B	2meg			R2-75		† QJ-1276A	■	Volume Note 1
	1meg Tap							
C	Switch			KR-7				Power Off-On
R2	600Ω	2(WW)	2090181-2			110-600	PFL-600	Sensitivity
R3	80Ω	2(WW)	2090808-2					Speaker Fader Note 2

† "Concentrikit" equivalent: K-8 kit with base elements & shafts: B11-140, P14-121 (Panel)
B18-139X, R1-202 (Rear)
76-2 (Switch)
R5 (Retainer)

■ "STA-LOC" equivalent: FA36L, RU26T16, OS1687, IS2187, US43.
Note 1. Model 04BM-1 uses Part #2090405-3.
Note 2. Model 04BM-1 uses Part #2090808-1.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	470K	
R5	220K	
R6	680Ω	
R7	1meg	
R8	33K	
R9	4700Ω	
R10	47meg	
R11	33meg	

ITEM No.	RATING	REMARKS
R12	22meg	
R13	150Ω	
R14	2.2meg	
R15	100K	
R16	22Ω	
R17	1500Ω	
R18	120K	
R19	4.7meg	

ITEM No.	RATING	REMARKS
R20	47K	
R21	1000Ω	
R22	220Ω	
R23	390Ω	
R24	5Ω 2W	#2090948-1
R25	.75Ω 2W	#2090948-3

Bendix Part Number.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		BENDIX PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	†						† Part of M1
L2	RF Choke	2090088-6						
L3	RF Coil	†						
L4	Osc. Coil	†						
L5	Input IF Trans.	2090907-3						
L6	Output IF Trans.	2090908-4						
L7	"A" Lead Choke	216188-19						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	BENDIX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5.5	1	2090815-1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
	PRI.	BENDIX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	20Ω Tap @ 8-10Ω	2090849-2							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	BENDIX PART No.	QUAM PART No.	
SP1	6"x 9"	PM	8-10Ω	2091269-4	69A2Z8.8	

MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
M1	Tuner	2090802-2	Complete, Includes Mounting Plate Assembly & Pushbuttons
M2	Spark Plate	220267-9	200mmf
M3	Spark Plate	220267-9	200mmf
M4	Spark Plate	220267-9	200mmf
	Printed Board	2090831-1	Less Tubes
	Printed Board	2090824-2	Tone Comp. (small)

CABINETS & CABINET PARTS

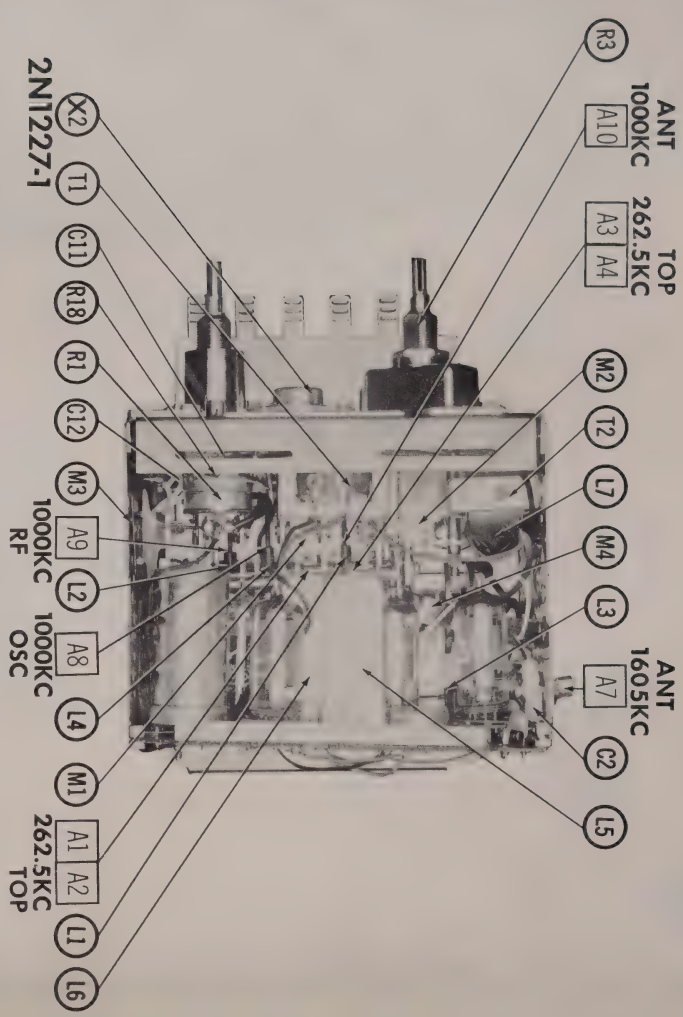
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	2090820-1	Tuning & Volume
Pushbutton Ass'y.	2090823-1	
Bezel	2090804-1	Model O4BM-1
Bezel	2090834-1	Model O4BM-2
Pointer	2090129-16	
Dial	2090812-1	Calibrated

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

CHASSIS—TOP VIEW



PHOTOFACT® Folder

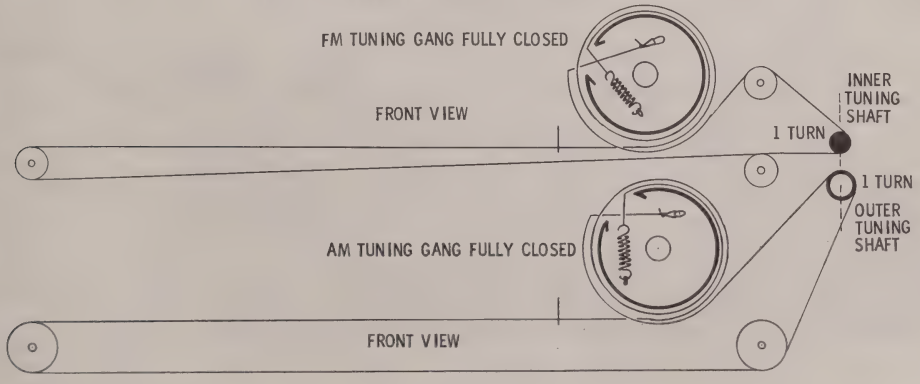
OLYMPIC CONTINENTAL MODEL Goldy 250

OLYMPIC CONTINENTAL
MODEL Goldy 250

OLYMPIC CONTINENTAL
MODEL Goldy 250

TRADE NAME	Olympic Continental Model Goldy 250
MANUFACTURER	Olympic, A Div. of the Siegler Corp., 34-01 38th Ave., Long Island City 1, N. Y.
TYPE SET	AC Operated 6 Tube FM-BC-SW Receiver
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 55 Watts, .53 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	510 - 1640KC FREQ. MOD. 88-108MC SHORT WAVE 5.77-18.8MC

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JK835

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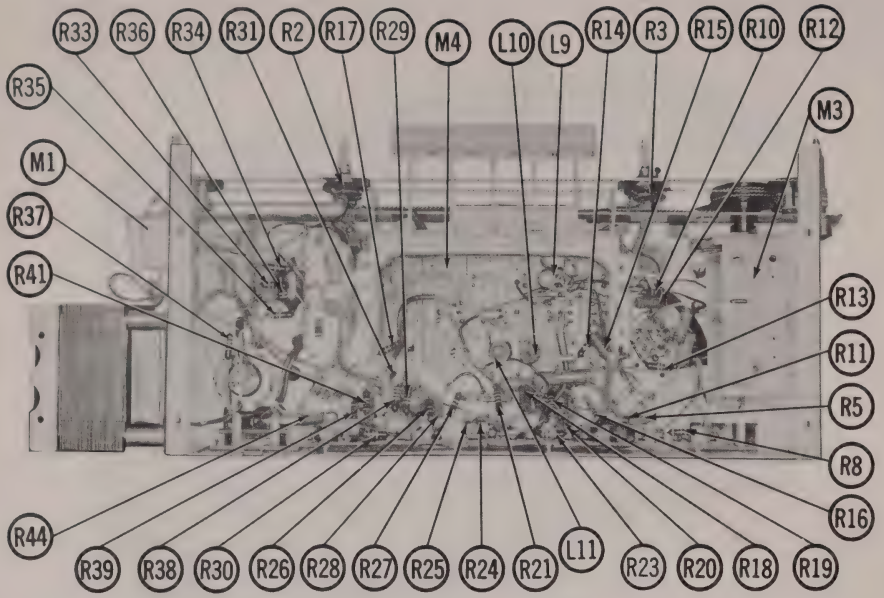
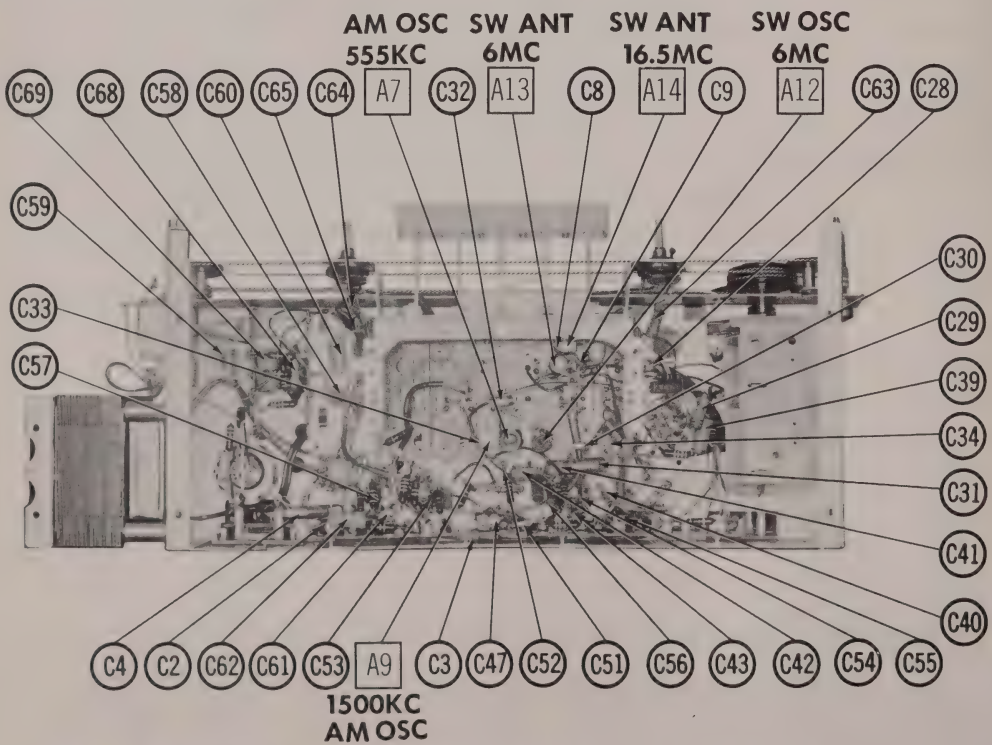
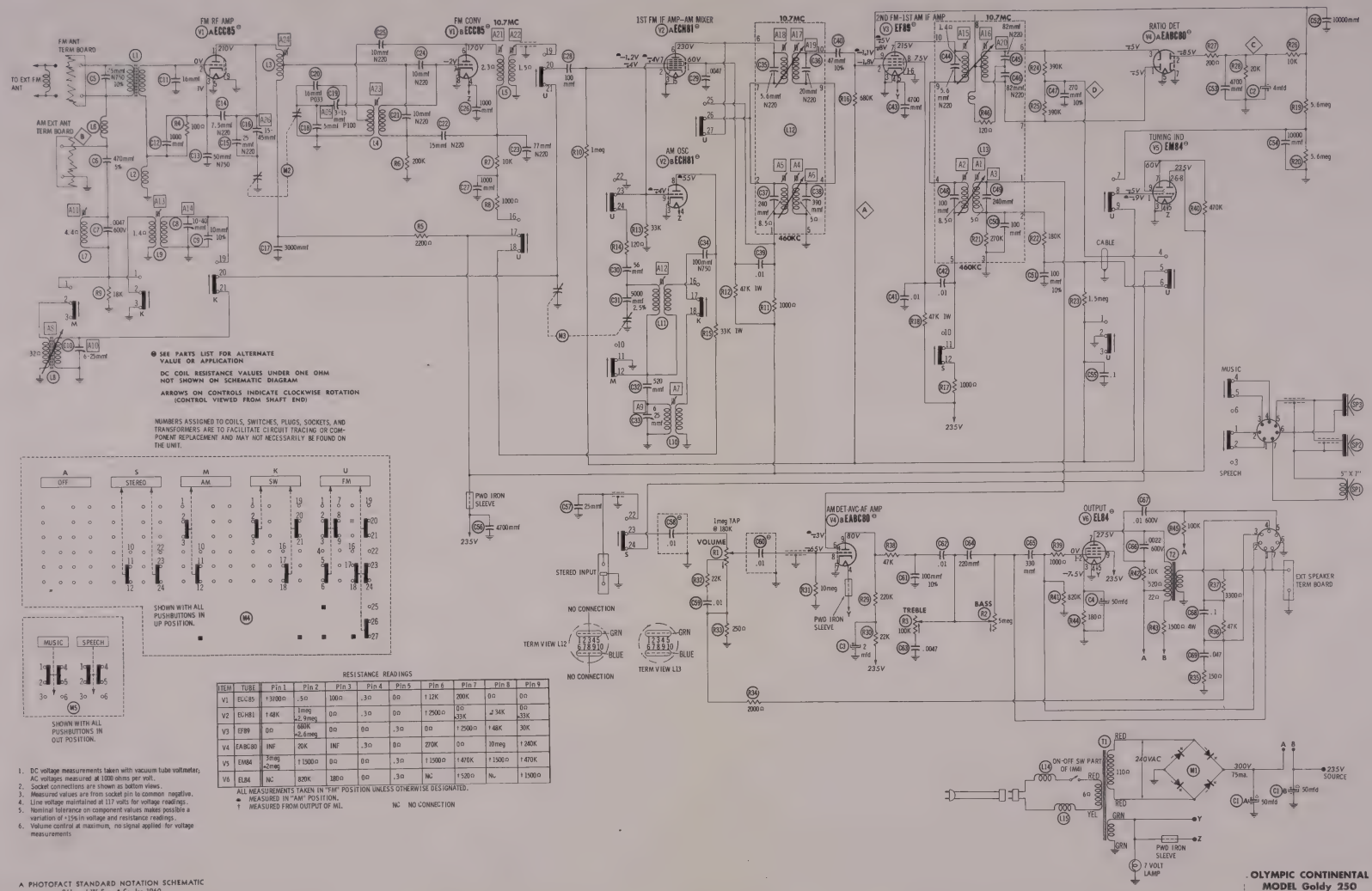
SET 495 FOLDER 14



CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR & MISC. IDENT.



CHASSIS BOTTOM VIEW - ALIGNMENT & CAPACITOR IDENT.



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85	†3300Ω	.5Ω	100Ω	.3Ω	0Ω	†12K	200K	0Ω	0Ω
V2	ECH81	†48K	1meg ±2.9meg	0Ω	.3Ω	0Ω	†2500Ω	0Ω ±33K	∠34K	0Ω ±33K
V3	EF89	0Ω	680R ±2.6meg	0Ω	0Ω	.3Ω	0Ω	†2500Ω	†48K	30K
V4	EABC80	INF	20K	INF	.3Ω	0Ω	270K	0Ω	10meg	†240K
V5	EM84	3meg ±2meg	†1500Ω	0Ω	0Ω	.3Ω	†1500Ω	†470K	†1500Ω	†470K
V6	EL84	NC	820K	180Ω	0Ω	.3Ω	NC	†520Ω	NC	†1500Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
● MEASURED IN "AM" POSITION.
† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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OLYMPIC CONTINENTAL
MODEL Goldy 250

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested alignment tools: A9, A10, A14... GENERAL CEMENT #8607, 9291, 9294
WALSCO #2520, 2522, 2523, 2524, 2534, 2537
A25, A26..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

AM ALIGNMENT—SELECTOR IN AM POSITION

Connect the negative lead of a 2.5 volt bias supply to point (A). Positive to chassis.

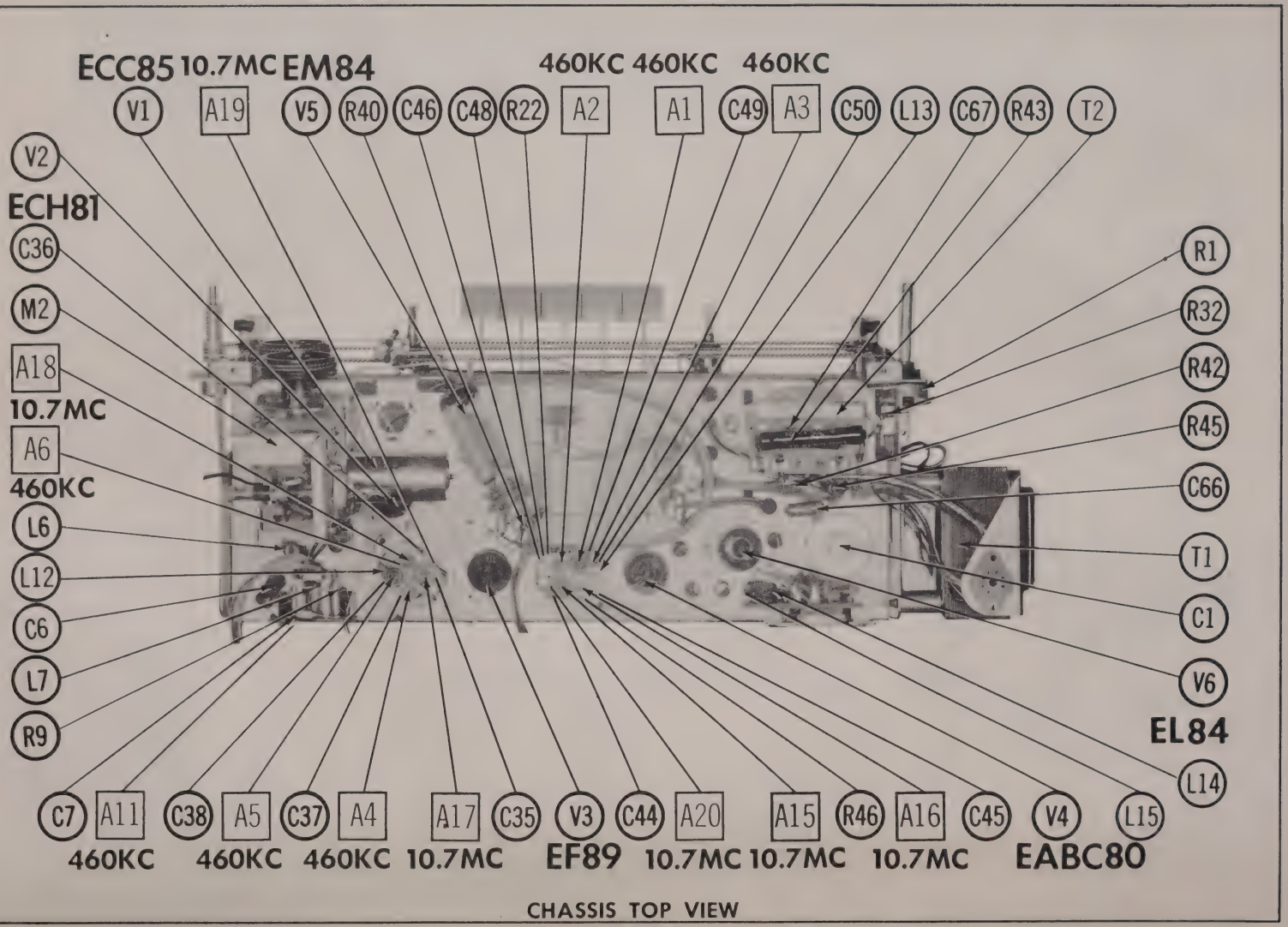
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru 5000mmf to pin 2 (grid) of AM Mixer. Low side to chassis.	460KC (400∿ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3,	Decrease coupling A3 by turning counterclockwise. Adjust A1 and A2 for maximum output. Adjust A3 for maximum output then back counterclockwise about 1/2 turn.
2.	"	"	"	"	A4, A5, A6	Decrease coupling A6 by turning counterclockwise. Adjust A4 and A5 for maximum output. Adjust A6 for maximum output then back counterclockwise about 1/2 turn.
3.	High side thru 120mmf and 400Ω in series to point (B). Low side to chassis.	555KC	555KC	"	A7, A8	Adjust for maximum output.
4.	"	1500KC	1500KC	"	A9, A10	"
5.	"	460KC	1000KC	"	A11	Adjust for MINIMUM output.
6.	"	6MC	(SW) 6MC	"	A12, A13	Adjust for maximum output.
7.	"	16.5MC	(SW) 16.5MC	"	A14	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	High side to ungrounded tube shield floating over FM Converter tube. Low side to chassis.	10.7MC (Unmod.)	(FM) 91MC	DC probe to point (C). Common to chassis.	A15	Detune A20 by turning counterclockwise. Adjust A15 for maximum deflection.
9.	"	"	"	DC probe to point (D). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
10.	"	"	"	DC probe to point (C). Common to chassis.	A17, A18, A19	Detune A19 by turning counterclockwise. Adjust A17 and A18 for maximum deflection. Adjust A19 for maximum deflection then back counterclockwise 1/2 turn.
11.	"	10.7MC (400∿ 30% AM Mod.)	"	Output meter across voice coil.	A20	Adjust for MINIMUM deflection. Repeat Steps 8 and 9 without disturbing A20.
12.	"	10.7MC (Unmod.)	"	DC probe to point (C). Common to chassis.	A21, A22	Adjust for maximum deflection.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
13.	Across FM antenna terminals.	98.4MC	(FM) 98.4MC	DC probe to point (C). Common to chassis.	A23, A24	Adjust for maximum deflection.
14.	"	89.1MC	89.1MC	"	A25, A26	"



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp.-FM Conv.	ECC85 (6AQ8) *	V4	Ratio Detector-AM Det.-AVC-AF Amp.	EABC80 (6T8) *
V2	1st FM IF Amp.-AM Mixer-AM Osc.	ECH81 (6AJ8) *	V5	Tuning Indicator	EM84 (6BR5) *
V3	2nd FM-1st AM IF Amp.	EF89 (6DA6) *	V6	Output	EL84 (6BQ5) *

* Alternate

ELECTROLYTIC CAPACITORS

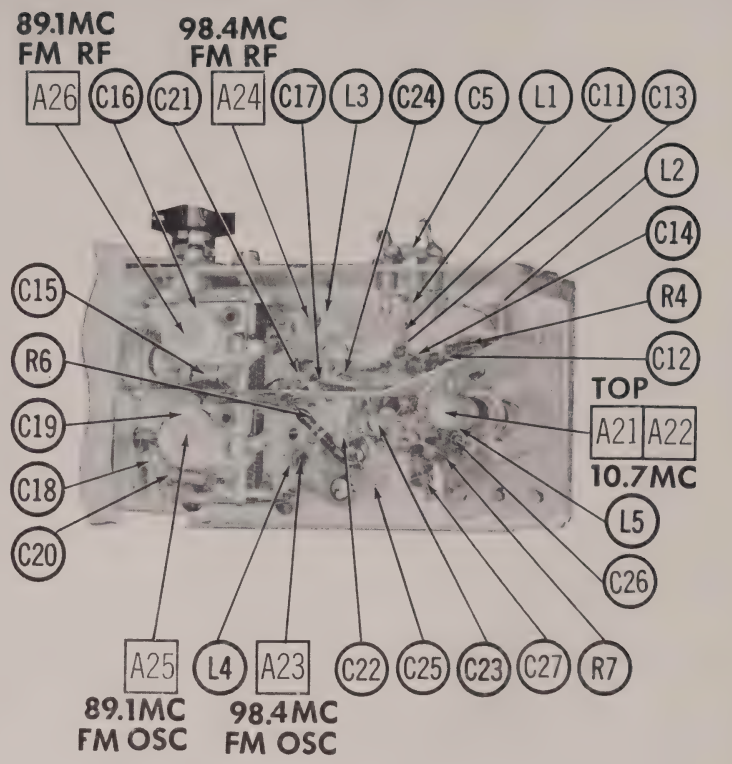
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲50	350	COG30117						
B	▲50	350							
C2	4	70	COG30128	PRS1400	BBR4-150	TT80X4	TD-4-150	TE-1403	
C3	2	350	COG30118	PRS1705	BR245	TT350X2	TD-2-450	TVA-1701	
C4	50	12	COG30119	SRE12V50	BBR50-25	TT15X50	TD-50-25	TE-1133	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	45 N750 10%		N750-SI 47	TCN-47	C10Q47U	CCTN-447	CN7-447	10TCU-Q47
C6	470 5%				5R5T47	CM-19B-471J	MCJ244	MS-347
C7	.0047 600V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C8	10-40							
C9	10 10%		NPO-SI 10	TCZ-10	C10QJC	CCTO-100	CNO-410	10TCC-Q10
C10	6-25							
C11	15		NPO-SI 15	TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C12	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	50 N750		N750-SI 50	TCN-50	C10Q50U	CCTN-470	CN7-447	10TCU-Q5
C14	7.5 N220					*		
C15	25 N220					*		10TCR-Q27
C16	15-45							
C17	3000		BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C18	5 P100							
C19	3-15							
C20	16 P033							
C21	10 N220					*		
C22	15 N220					*		10TCR-Q10
C23	77 N220					*		10TCR-Q15
C24	10 N470					*		10TCR-Q82
C25	10 N220					*		
C26	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	10TCR-Q10 5HK-D10
C27	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C28	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C29	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C30	56		NPO-SI 56	D6-560	L10Q56	CCD-560	GP456	10TS-Q56
C31	5000 2.5%							
C32	520		SI 510	DD-511	L10T51	CCD-501	GP350	10TS-T50
C33	6-25							
C34	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C35	5.6 N220					*		10TCR-V56
C36	20 N220					*		10TCR-Q20
C37	240		SI 240	DD-241	L10T24	CCD-251	GP324	10TS-T24
C38	390		SI 390	D6-391	L10T39	CCD-391	B-339	10TS-T39
C39	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C40	47 10%		NPO-SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C41	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C42	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C43	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C44	5.6 N220					*		10TCR-V56
C45	82 N220					*		10TCR-Q82
C46	82 N220					*		10TCR-Q82
C47	270 10%		NPO-SI 270	D6-271	L10T27	CCD-271	GP327	10TS-T27
C48	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C49	240		SI 240	DD-241	L10T24	CCD-251	GP324	10TS-T24
C50	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C51	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10

FM RF SUBCHASSIS



FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C52	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C53	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47
C54	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C55	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C56	4700		SI 4700	D6-472	BYA10D47M	CCD-472	B-247	5HK-D47

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C57	25		SI 25	D6-250	L10Q25	CCD-250	GP425	10TS-C25
C58	.01 500V	Note 1						
C59	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C60	.01 500V	Note 1						
C61	100 10%		NPO-SI 100	D6-101	L10T10	CCD-101	GP310	10TS-T10
C62	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C63	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C64	220		SI 220	D6-221	L10T22	CCD-221	B-322	10TS-T22
C65	330		SI 330	D6-331	L10T33	CCD-331	B-333	10TS-T33
C66	.0022 600V		P688N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6233	6TM-D33
C67	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C68	.1 250V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C69	.047 250V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-6147	4TM-S47

Note 1. Shielded unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	1/2	PTG30124	ABT-72				Volume
	180K Tap							
B	Shaft			AK-29				
R2	5meg	1/4	PTG30089					Bass
R3	100K	1/4	PTG30090					Treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100Ω	
R5	2200Ω	
R6	200K	
R7	10K	
R8	1000Ω	
R9	18K	
R10	1meg	
R11	1000Ω	
R12	47K 1W	
R13	33K	
R14	120Ω	
R15	33K 1W	
R16	680K	
R17	1000Ω	
R18	47K 1W	

ITEM No.	RATING	REMARKS
R19	5.6meg	
R20	5.6meg	
R21	270K	
R22	180K	
R23	1.5meg	
R24	390K	
R25	390K	
R26	10K	
R27	200Ω	
R28	20K	
R29	220K	
R30	22K	
R31	10meg	
R32	22K	
R33	250Ω	

ITEM No.	RATING	REMARKS
R34	2000Ω	
R35	150Ω	
R36	47K	
R37	3300Ω	
R38	47K	
R39	1000Ω	
R40	470K	
R41	820K	
R42	10K	
R43	1500Ω 4W	
R44	180Ω	
R45	100K	
R46	120Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Trans.	CKG30127						
L2	Cathode Choke	CKG30122						
L3	FM RF Coil							
L4	FM Osc. Coil							
L5	1st FM IF	CLG30106						
L6	RF Choke	CKG30123	19-1008	19-1008	SW-631	4520		5uh
L7	IF Trap Coil	CLG30142						
L8	Loopstick	LPG30107			BC-419			
L9	SW Ant. Trans.							
L10	AM Osc. Coil							
L11	SW Osc. Coil							
L12A	2nd FM IF Trans.	TRG30110						
B	1st AM IF Trans.							
L13A	Ratio Det.	TRG30111						
B	2nd AM IF Trans.							

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L14	Line Choke		19-6033	19-6033				30uh
L15	Line Choke		19-6033	19-6033				30uh

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .53A	240V@ .075A	6.3V@ 2.6A	TRG30080						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6500Ω Tap@ 260Ω (4%)	3-4Ω								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	5"x 7"	PM	3-4Ω	SKG30125	57A1Z4	
SP2	Electrostatic			SKG30079		
SP3	Electrostatic			SKG30079		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	OLYMPIC PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.075A	RFG30088 *					* Selenium Bridge

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M2	FM Tuner	CVG30138	Complete (Includes Tuning Cap Part #CVG30114)
M3	Tuning Cap	CVG30115	AM, 2 Gang
M4	Switch	PBG30112	Pushbutton Assembly, Includes Power Switch Part #SWG30093, Stereo, AM, SW, & FM

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KNG30098	FM Tuning
Knob	KNG30099	AM Tuning
Knob	KNG30100	Volume (large)
Knob	KNG30101	Volume (small)
Knob	PTG30132	Bass, Treble
Dial	DLG30097	
Cabinet	CAG30130	

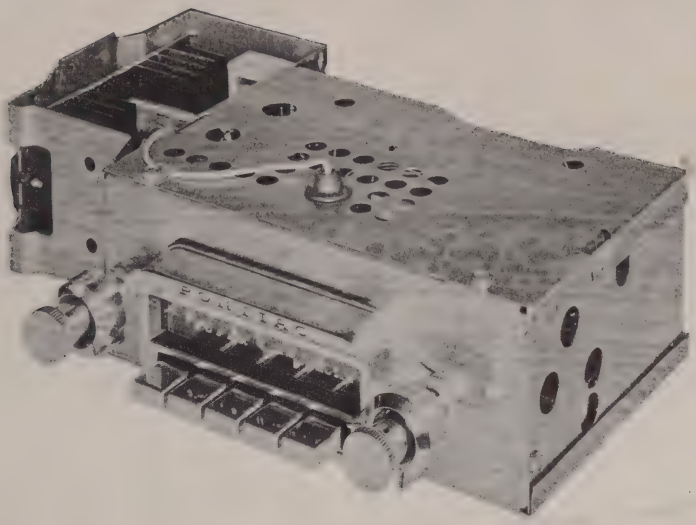
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

PONTIAC
MODEL 989614



TRADE NAME	Pontiac Model 989614 (For 1960 Pontiac Automobiles)
MANUFACTURER	Delco Radio Div., G.M. Corp., Kokomo, Indiana
TYPE SET	Battery Operated 4 Tube, 1 Transistor Custom Built Automobile Receiver
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	535 — 1615KC RATING 2.3 Amp. @ 12.6 Volts

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4.... GENERAL CEMENT #9440
A5, A9, A10.... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A6, A7, A8.... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	262KC (400∿ Mod.)	High Freq. End Stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
	Check setting of Oscillator core (A5). Rear of core should be 1 5/8" from mounting end of coil form.					
2.	High side thru 68mmf to antenna receptacle. Low side to chassis.	1615KC	"	"	A6, A7, A8	"
3.	"	600KC	600KC Signal	"	A9, A10	"
4.	"	1615KC	1615KC Signal	"	A7, A8	"
5.	"	1100KC	1100KC Signal	"		Adjust pointer adjustment until pointer coincides with 1100 on dial.
	With radio installed in car and antenna fully extended, tune in a weak station near 900KC and adjust A8 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining pushbuttons.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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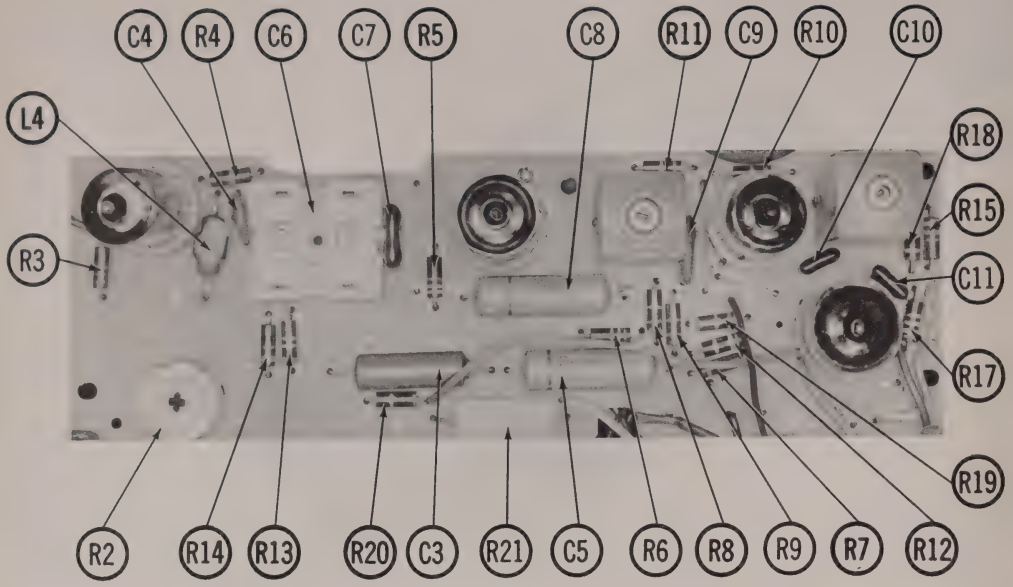
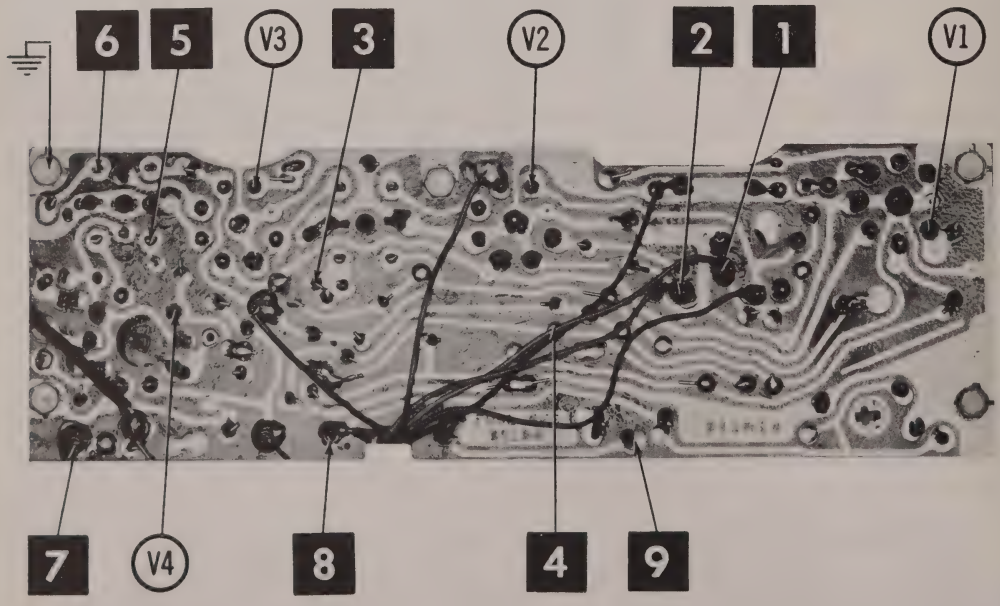
KD077

PONTIAC
MODEL 989614
PONTIAC
MODEL 989614
SET 495 FOLDER 15



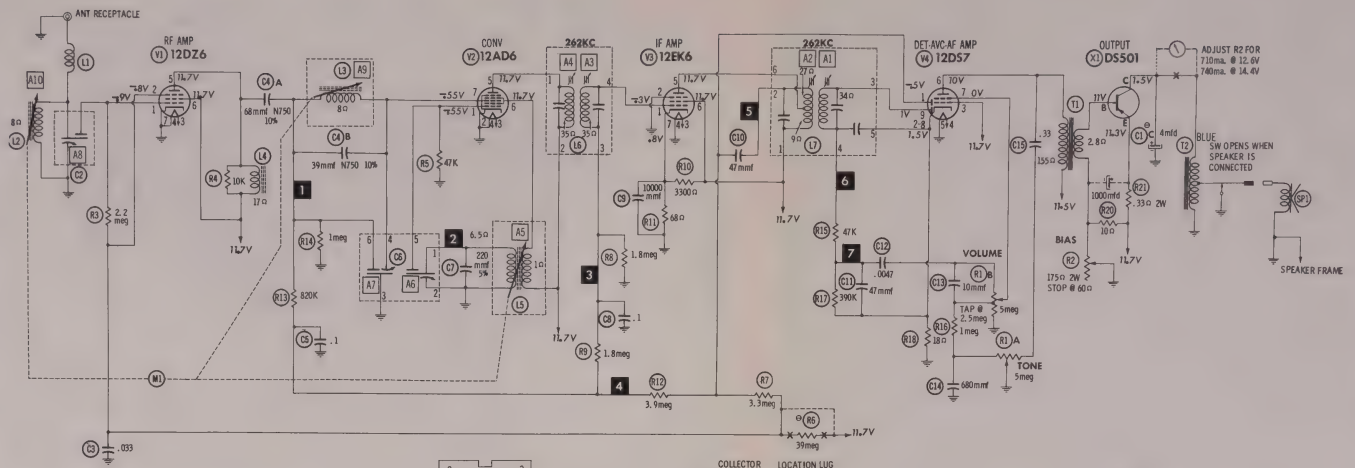
PRINTED BOARD



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

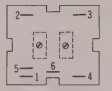
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

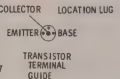


NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

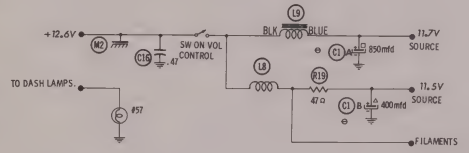
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM





1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12DZ6	10.5meg	8.2meg	.1Ω	0Ω	48Ω	47Ω	0Ω		
V2	12AD6	47K	0Ω	.1Ω	0Ω	83Ω	48Ω	1meg		
V3	12EK6	2meg	0Ω	.1Ω	0Ω	58Ω	47Ω	68Ω		
V4	12DS7	4.9meg	18Ω	48Ω	.1Ω	0Ω	200Ω	0Ω	18Ω	435K

TRANSISTOR CIRCUIT RESISTANCE FOR X1 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE™

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PONTIAC
MODEL 989614

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •	GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •

ITEM No.	USE	TYPE
V1	RF Amplifier	12DZ6
V2	Converter	12AD6
V3	IF Amplifier	12EK6
V4	Det. -AVC-AF Amp.	12DS7

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	DS-501	Output	2N235A			2N677 *	PNP * Mounting Change, Drill new mounting holes.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■850	16	7273729 ①	AFH3-54-30		WP300.7		TVLS-3021 *	
B	▲400	16							
C	4	11.5							

① Some versions may use Part #7273810 in this application.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2		#7274175						
C3	.033 75V		P288N-033	DD-303	PM4S33	1DP-2-333	GEM-4133	6TM-S33
C4A	68 N750 10%		N750-DI 68	DTN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
B	39 N750 10%			TCN-39	C10Q39U	CCTN-390	CN7-439	10TCU-Q39
C5	.1 75V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C6A		#7273693						
B								
C7	220 5%		1469-00022	TCZ-220	22R5Q22	CM-19B-221J	CNO-322	MS-322
C8	.1 75V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P1
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	47		1468-000047	TCZ-47	5W5Q47	CM-19B-470M	CNO-447	1FM-447

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C11	47		1468-000047	TCZ-47	5W5Q47	CM-19B-470M	CNO-447	1FM-447
C12	.0047 200V		P288N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C13	10		DI-10	DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C14	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C15	.33 100V		P288N-33		PM4P33	2DP-5-334	GEM-2023	
C16	.47 100V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47

Delco Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	5meg		7275708					Tone
B	5meg							Volume
	2.5meg Tap					† QJ-1346A		
C	Switch							Power On-Off
R2	175Ω	2(WW)	1221422					Bias
	60Ω Stop							

† "Concentrikit" equivalent: K-8 kit with base elements and shafts: B13-141, P17-031 (Panel)
B18-141X, R1-115 (Rear)
76-1 (Switch)
S40 (Bushing)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	2.2meg	
R4	10K	
R5	47K	
R6	39meg	Note 1
R7	3.3meg	
R8	1.8meg	
R9	1.8meg	

ITEM No.	RATING	REMARKS
R10	3300Ω	
R11	68Ω	
R12	3.9meg	
R13	820K	
R14	1meg	
R15	47K	
R16	1meg	

ITEM No.	RATING	REMARKS
R17	390K	
R18	18Ω	
R19	47Ω	
R20	10Ω	
R21	.33Ω 2W	#7271375

Delco Part Number, Fuse Type.
Note 1. Not used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		DELCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	RF Choke	7255738	19-1004	19-1004	BC-565	4610		6.5uh
L2	Ant. Coil	1221138						
L3	RF Coil	1221138						
L4	RF Choke	7269684						1.8MH
L5	Osc. Coil	1221151						
L6	Input IF Trans.	1221257	16-6756	16-6756	BC-344	13-PH1		
L7	Output IF Trans.	1221253						
L8	Hash Choke	1217846						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L9	.740A	.7Ω	.011 HY	7274342				TC-2		

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4.4	1	1221425			TA-48			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
	PRI.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	10Ω Tap @ 3-4Ω	1221428				TA-50			

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	4"x 10"	PM	3-4Ω	7275766 *		* Alternate Part #6109

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M1	Tuner	7271564	Pushbutton, Series P2
M2	Spark Plate		

CABINETS & CABINET PARTS

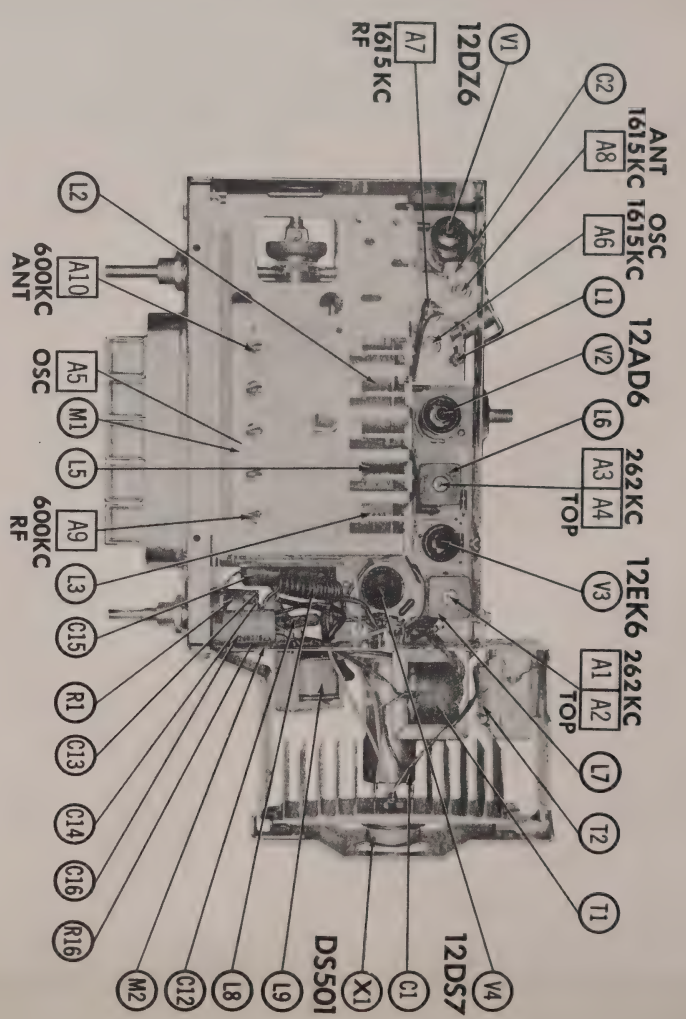
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	536196	Tuning, Volume
Knob	532455	Tone, (Catalina Series only)
Knob	536278	Tone
Knob	536108	Dummy
Knob	532707	Dummy (Catalina Series only)
Pointer	7273355	
Pushbutton	1221459	Front Bearing Plates & Slides
Pushbutton	7275218	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

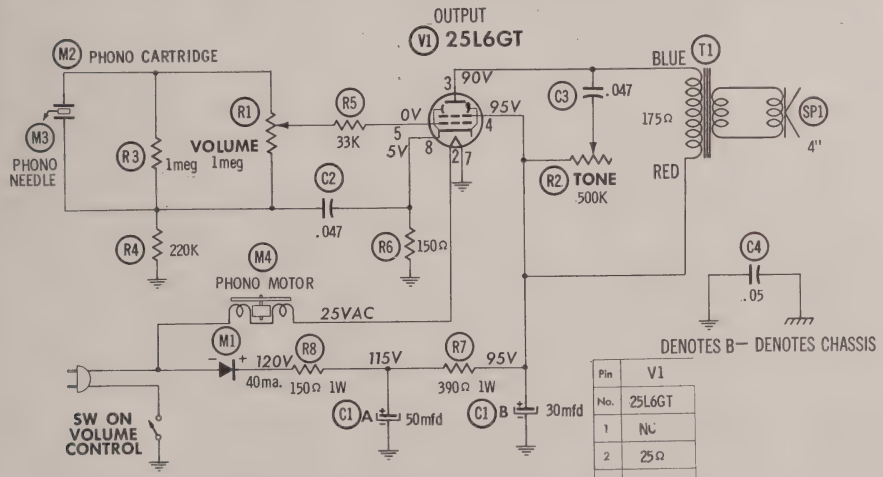
CHASSIS—TOP VIEW



PHOTOFACT® Folder

ROLAND
MODEL 41-682

TRADE NAME	Roland Model 41-682
MANUFACTURER	Roland Radio Corp., 716 S. Columbus Ave., Mount Vernon, N. Y.
TYPE SET	AC Operated One Tube Phono Amplifier With 4 Speed Manual Record Player
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 41 Watts, .38 Amp. @117 Volts AC (Less Motor)



Pin	V1
No.	25L6GT
1	NC
2	25Ω
3	†715Ω
4	†540Ω
5	250K
6	TP
7	0V
8	150Ω

A PHOTOFACT STANDARD NOTATION SCHEMATIC

† MEASURED FROM OUTPUT OF M1.

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ROLAND
MODEL 41-682
ROLAND
MODEL 41-682
SET 495 FOLDER 16

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE	TYPE
V1	Output	25L6GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	ROLAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150		PRS2200	BBRD5315	WD210	TDLD-8	TVA-2450	
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C3	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C4	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	ROLAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	360281	B-70-S	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R2A	100K	½	360250	B-41	A47-100K-Z	Q13-128	U39	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1meg	
R4	220K	
R5	33K	
R6	150Ω	
R7	390Ω 1W	
R8	150Ω 1W	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	ROLAND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4000Ω	3-4Ω	430574	24S48	A-3025	AU-601①	A-3877①	24S48	S-3X①	

① Drill New Mounting Hole.

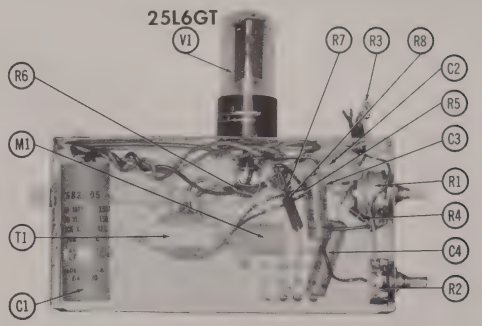
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	ROLAND PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	404003	4A07	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	ROLAND PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.040A		T100 ①	1235AH ①	100A ①	SR200②	① Silicon ② Selenium

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	ROLAND PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2		420TS-TB	N8-1 N8-3			49	VA29 or VA29D VA29LP or VA29LPD		

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	ROLAND PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3		W-61S † or W-61D ♦	VA29 † or VA29D ♦	† Jewel ♦ Diamond
		W-61MGS † or W-61MGD ♦	VA29LP † or VA29LPD ♦	

MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M4	Motor	310041	Alliance (4 Speed)
M5	Tone Arm	323006	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	270146	Loudness
Knob	270147	Tone
Cabinet	241170	Two-Tone Green
Cabinet	241180	Red & Grey

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder with CIRCUITRACE®

STEELMAN MODEL 2-6522-1

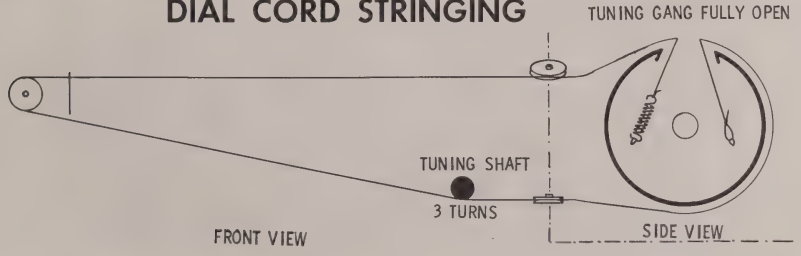
STEELMAN MODEL 2-6522-1

STEELMAN MODEL 2-6522-1

TRADE NAME	Steelman Model 2-6522-1		
MANUFACTURER	Steelman Phono & Radio Co., 2-30 Anderson Ave., Mount Vernon, N. Y.		
TYPE SET	AC Operated 7 Tube FM-AM Tuner, 4 Tube Stereo Amplifier and 4 Speed Automatic Record Changer		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	83 Watts, .94 Amp. @ 117 Volts AC (FM-AM)
TUNING RANGE—BROADCAST	535 — 1600KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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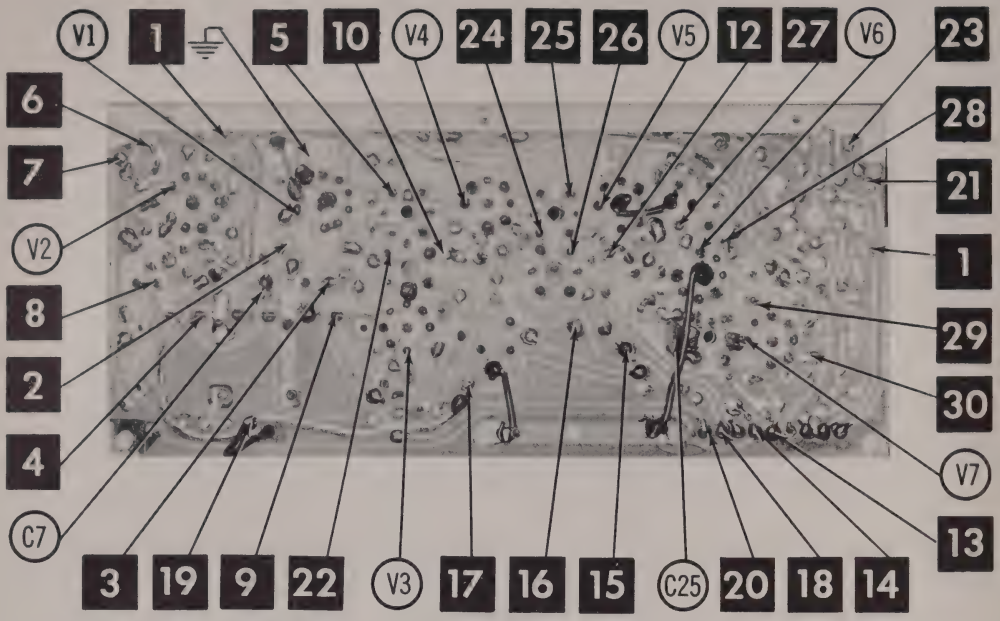
KN002

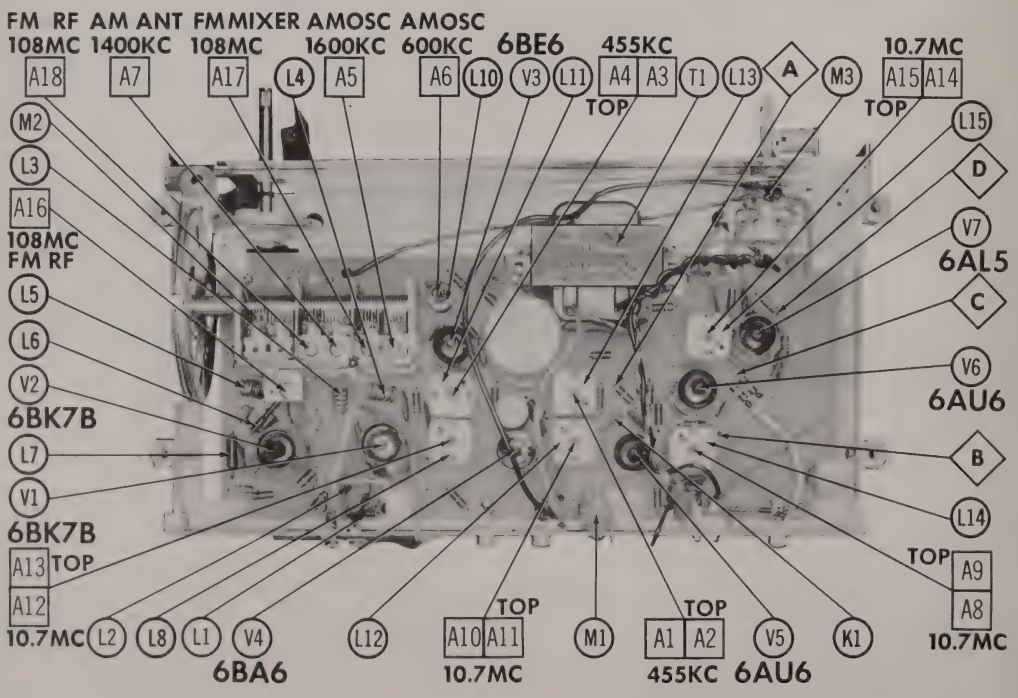
SET 495 FOLDER 17



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



TUNER CHASSIS TOP VIEW - ALIGNMENT, INDUCTOR, TUBE & MISC. IDENT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested alignment tools:
A1 thru A4, A8 thru A15.....GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A7, A16, A17, A18..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT — SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to AM Ant. Stator lug of tuning gang. Low side to chassis.	455KC (Unmod.)	(AM) Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	1600KC	1600KC	"	A5	"
3.	"	600KC	600KC	"	A6	Adjust for maximum deflection. Repeat Steps 2 and 3.
4.	High side thru .01mfd to AM antenna terminal. Low side to chassis.	1400KC	Tune to 1400KC Signal.	"	A7	Adjust for maximum deflection while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru 200mmf to FM RF Stator lug of tuning gang. Low side to chassis.	10.7MC (Unmod.)	(FM) point of non-interference.	DC probe thru 1meg to point Ⓑ. Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
6.	"	"	"	DC probe thru 1meg to point Ⓒ. Common to chassis.	A14	"
7.	"	"	"	DC probe to point Ⓓ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru 200mmf to FM RF Stator lug of tuning gang. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	"	"	Vert. amp. thru 27K to point Ⓒ. Low side to chassis.	A14	"
7.	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	High side to FM antenna terminal thru 270Ω. Low side to chassis.	108MC (Unmod.)	(FM) 108MC	DC probe thru 1meg to point Ⓑ. Common to chassis.	A16, A17, A18	Adjust for maximum deflection.
9.	"	90MC	90MC	"	L5, L4, L3	Adjust for maximum deflection by expanding or compressing coil turns. Repeat Step 8.

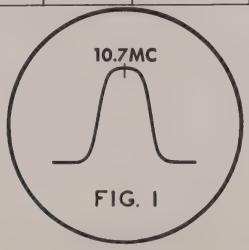


FIG. 1

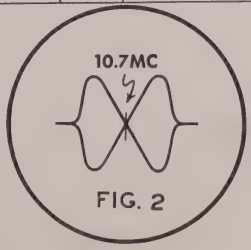
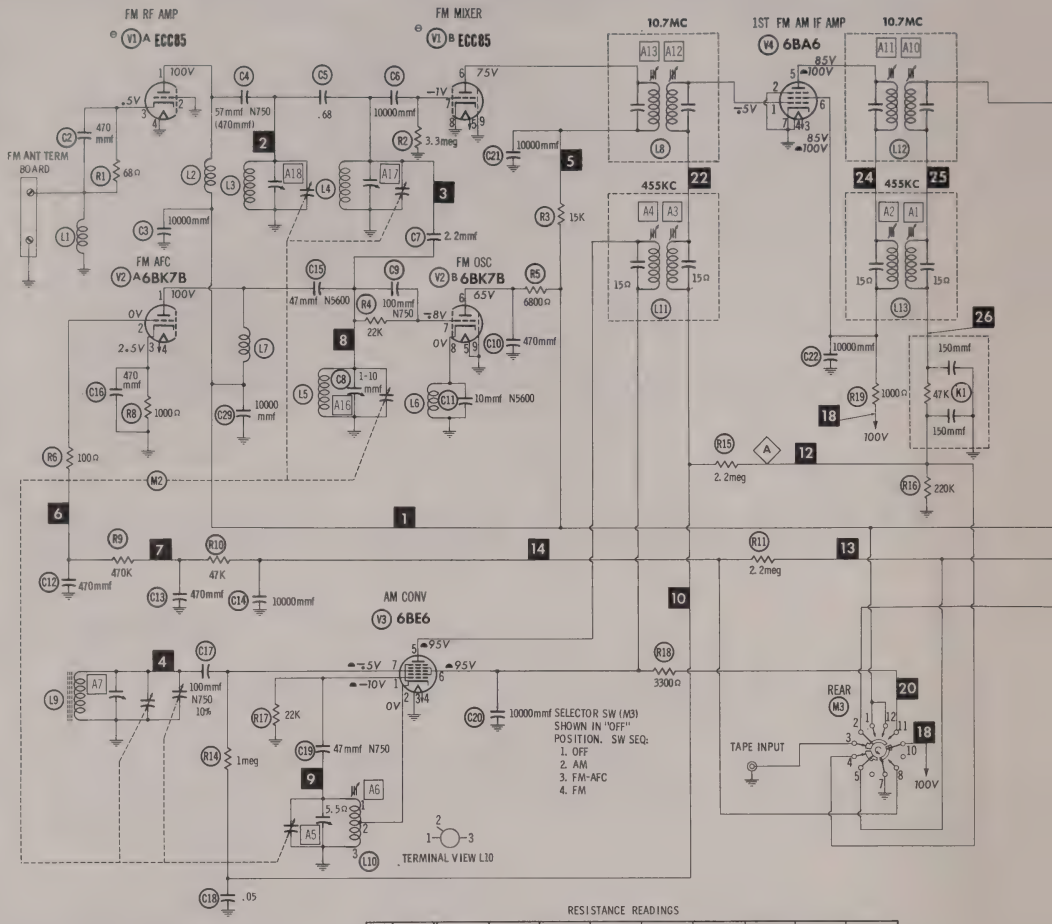


FIG. 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BK7B	†690Ω	0Ω	68Ω	0Ω	.3Ω	†16K	3.3meg	0Ω	0Ω
V2	6BK7B	†690Ω	520K ■2.8meg	1000Ω	.3Ω	0Ω	†7400Ω	22K	.9Ω	0Ω
V3	6BE6	▬22K	.5Ω	0Ω	.3Ω	†▬4000Ω	†▬4000Ω	▬3.4meg		
V4	6BA6	2.4meg	0Ω	.3Ω	0Ω	†1700Ω	†1700Ω	0Ω		
V5	6AU6	270K	0Ω	.3Ω	0Ω	†2700Ω	†2700Ω	0Ω		
V6	6AU6	100K	0Ω	.3Ω	0Ω	†10K	†10K	0Ω		
V7	6AL5	0Ω	100K	.3Ω	0Ω	200K	0Ω	100K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
■ MEASURED IN "AM" POSITION.
▬ MEASURED IN "FM-AFC" POSITION.
† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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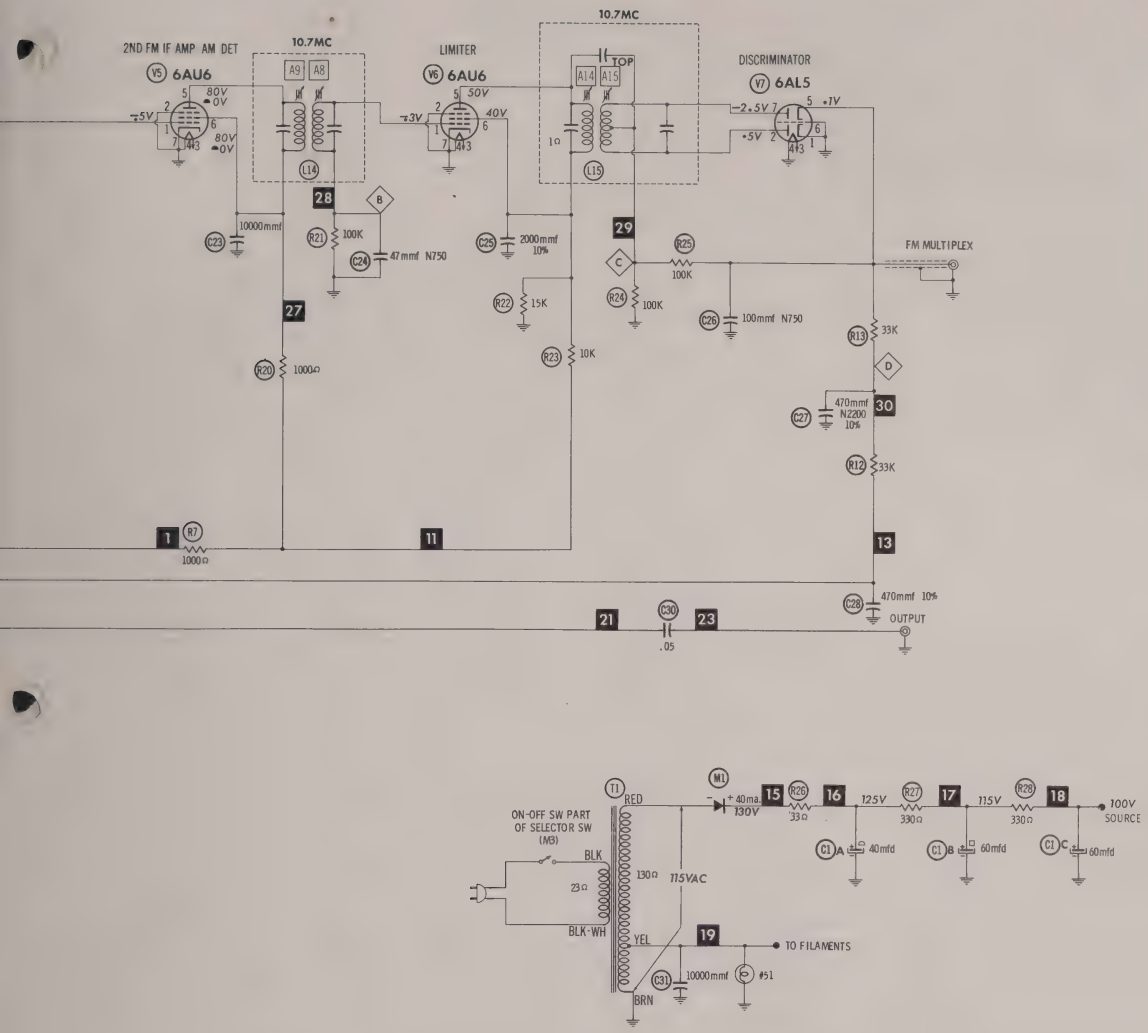
TUNER SCHEMATIC



STEELMAN MODEL 2-6522-1

STEELMAN MODEL 2-6522-1

FOLDER 17

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Mixer	ECC85/6AQ8(6BK7B*	V5	2nd FM IF Amp. -AM Det. -AVC	6AU6
V2	FM Osc. -FM AFC	6BK7B	V6	FM Limiter	6AU6
V3	AM Converter	6BE6	V7	Discriminator	6AL5
V4	1st FM-AM IF Amp.	6BA6			

CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▪40	150				PFP311, 53		PCL-3443, 5	
B	▪60	150							
C	60	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C4	47 N750	(470) †	N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C5	.68		NPO-SI .68	TCZ-R68				
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	2.2		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C8	1-10			829-10				
C9	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C10	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C11	10 N5600					*		
C12	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C13	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C15	47 N5600					*		
C16	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C17	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C18	.05 200V		P2151N-047	DD-503	BC2S47J	4DP-3-503	ACE6147	2SE-S47
C19	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C23	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C24	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C25	2000 10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20
C26	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C27	470 N2200 10%					*		
C28	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C30	.05 200V		P2151N-047	DD-503	BC2S47J	4DP-3-503	ACE6147	2SE-S47
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	STEELMAN PART No.	REPLACEMENT DATA	
K1	AM Det. RF Filter	150mmf, 150mmf, 47K		Aerovox	PA-98
				Centralab	PC-51
				Cornell-Dublier	111TM2
				Sprague	D-2

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	68Ω	
R2	3.3meg	
R3	15K	
R4	22K	
R5	6800Ω	
R6	100Ω	
R7	1000Ω	
R8	1000Ω	
R9	470K	
R10	47K	

ITEM No.	RATING	REMARKS
R11	2.2meg	
R12	33K	
R13	33K	
R14	1meg	
R15	2.2meg	
R16	220K	
R17	22K	
R18	3300Ω	
R19	1000Ω	
R20	1000Ω	

ITEM No.	RATING	REMARKS
R21	100K	
R22	15K	
R23	10K	
R24	100K	
R25	100K	
R26	33Ω	
R27	330Ω	
R28	330Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA STEELMAN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	RF Choke							
L2	RF Choke							
L3	FM RF Coil							
L4	FM Mixer Coil							
L5	FM Osc. Coil							
L6	Cathode Choke							
L7	RF Choke							
L8	1st FM IF Trans.		16-3490	16-3490		1463-PC		
L9	Loopstick				BC-419			
L10	AM Osc. Coil							
L11	1st AM IF Trans.		16-6780	16-6780	BC-356	13-PC1	RF-4	
L12	2nd FM IF Trans.		16-3490	16-3490		1463-PC		
L13	2nd AM IF Trans.		16-6780	16-6780	BC-356	13-PC1	RF-4	
L14	3rd FM IF Trans.		16-3490	16-3490		1463-PC		
L15	Discriminator							

TRANSFORMER (POWER)

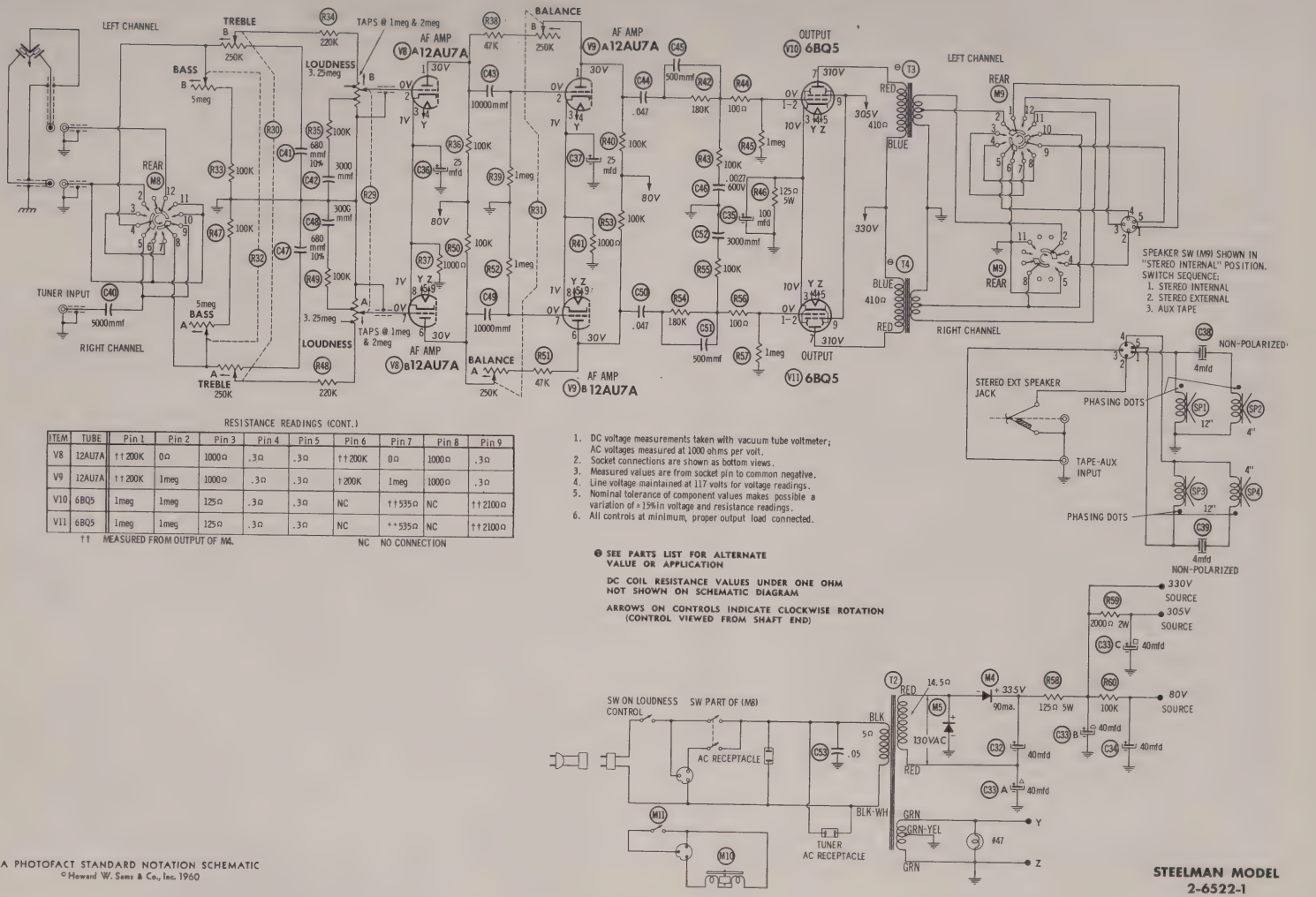
ITEM No.	RATING PRI.	RATING SEC. 1	REPLACEMENT DATA STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .26A	115V@ .040A Tap@6.3V@2.4A	FT781419P						

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA STEELMAN PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.040A		T065 ①	1234AH ①	65A ①	SR200 ②	① Selenium Type ② Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M2	Tuning Cap.		3 Gang
M3	Switch		Function (Rotary Wafer Type)



RESISTANCE READINGS (CONT.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V8	12AU7A	††200K	0Ω	1000Ω	.3Ω	.3Ω	††200K	0Ω	1000Ω	.3Ω
V9	12AU7A	††200K	1meg	1000Ω	.3Ω	.3Ω	††200K	1meg	1000Ω	.3Ω
V10	6BQ5	1meg	1meg	125Ω	.3Ω	.3Ω	NC	††535Ω	NC	††2100Ω
V11	6BQ5	1meg	1meg	125Ω	.3Ω	.3Ω	NC	††535Ω	NC	††2100Ω

†† MEASURED FROM OUTPUT OF M4. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±1% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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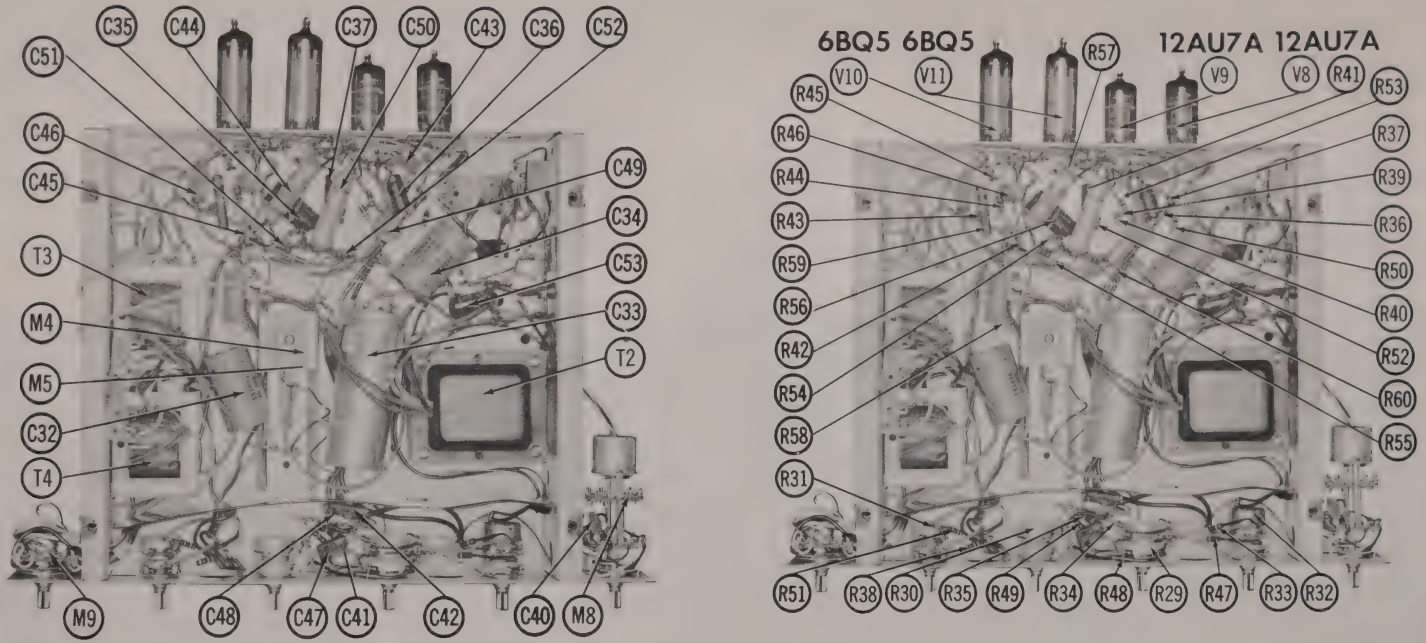
STEELMAN MODEL 2-6522-1

AMP SCHEMATIC



AMP CHASSIS - BOTTOM VIEW

AMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V8	Left Channel AF Amp. - Right Channel AF Amp.	12AU7A
V9	Left Channel AF Amp. - Right Channel AF Amp.	12AU7A
V10	Left Channel Output	6BQ5
V11	Right Channel Output	6BQ5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C32	40	250	581029	PRS1580	BR4025	TC58	TD-40-250	TVA-1511	
C33A	▲40	450	583027	AFH3-44	C0350	FP377	TMT-40	TVL-3787	
B	●40	450							
C	■40	250							
C34	40	250	581029	PRS1580	BR4025	TC58	TD-40-250	TVA-1511	
C35	100	25	581027	PRS1270	BBR100-25	TC2501	TD-100-25	TVA-1207	
C36	25	25		XPP-25025	NLW20-25	TT25X25	ML20-25	TE-1207	
C37	25	25		XPP-25025	NLW20-25	TT25X25	ML20-25	TE-1207	
C38	4	50NP		NP-PRS7405	BBR4-150	TCN504		TVANS-1302.5*	
C39	4	50NP		NP-PRS7405	BBR4-150	TCN504		TVANS-1302.5*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C40	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C41	680 10%		1469-00068		1R5T68	CM-19B-681K	MCJ249	MS-368
C42	3000		SI 3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C43	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C44	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C45	500		SI 500	DD-501	BYA10T5	CCD-501	GP350	10TS-T50
C46	.0027 600V		P688N-003	D6-272	CUB6D3	6DP-1-272	GEM-623	6TM-D3
C47	680 10%		1469-00068		1R5T68	CM-19B-681K	MCJ249	MS-368
C48	3000		SI 3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C49	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C50	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C51	500		SI 500	DD-501	BYA10T5	CCD-501	GP350	10TS-T50
C52	3000		SI 3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C53	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R29A	3.25meg*	1	368037					Loudness, Right Channel
B	3.25meg*							Loudness, Left Channel
R30A	250K		368035	B-50	AD47-250K-S		FA254L	Treble, Right Channel
B	250K			SR-50	Not Req.		RU254L	Treble, Left Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R31A	250K	1	368035	B-50	AD47-250K-S		FA254L	Balance, Left Channel
B	250K			SR-50	Not Req.		RU254L	Balance, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R32A	5meg	1	368038	B-88	AD47-5meg-S		FA56A	Bass, Right Channel
B	5meg			SR-88	Not Req.		RU56A	Bass, Left Channel
C	Shaft			Not Req.	KSS-3		CS3500	
D	Switch			KR-1	SWE-12		US41	Power Off-On

* Taps @ 1meg and 2 meg.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R33	100K	
R34	220K	
R35	100K	
R36	100K	
R37	1000Ω	
R38	47K	
R39	1meg	
R40	100K	
R41	1000Ω	
R42	180K	

ITEM No.	RATING	REMARKS
R43	100K	
R44	100Ω	
R45	1meg	
R46	125Ω 5W	#510005
R47	100K	
R48	220K	
R49	100K	
R50	100K	
R51	47K	
R52	1meg	

ITEM No.	RATING	REMARKS
R53	100K	
R54	180K	
R55	100K	
R56	100Ω	
R57	1meg	
R58	125Ω 5W	#510005
R59	2000Ω 2W	
R60	100K	

Steelman Part Number.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V@ .68A	130V@ .320A	6.3V@ 2.3A	440021						

AMP PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	6200Ω	3-4Ω	430564 ①							
T4	6200Ω	3-4Ω	430564 ①							

① Alternate Part #430576.

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA STEELMAN PART No.	QUAM PART No.	NOTES
SP1	12"	PM	3-4Ω	409005	12A6A	
SP2	4"	PM	3-4Ω	404009	4A1T	
SP3	12"	PM	3-4Ω	409005	12A6A	
SP4	4"	PM	3-4Ω	404009	4A1T	

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA STEELMAN PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M4	.090A		RS150 ①	1235AH ①	150 ①	SR200 ②	① Selenium Type
M5	.090A		RS150 ①	1235AH ①	150 ①	SR200 ②	② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M6		80-TS		26ST	S1-1 S3-3			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M7		W-104STS † or W-104STD ♦	CRA-57† or CRA-57D ♦	† Jewel ♦ Diamond
		W-104MGS † or W-104MGD ♦	CRA-57X † or CRA-57XD ♦	

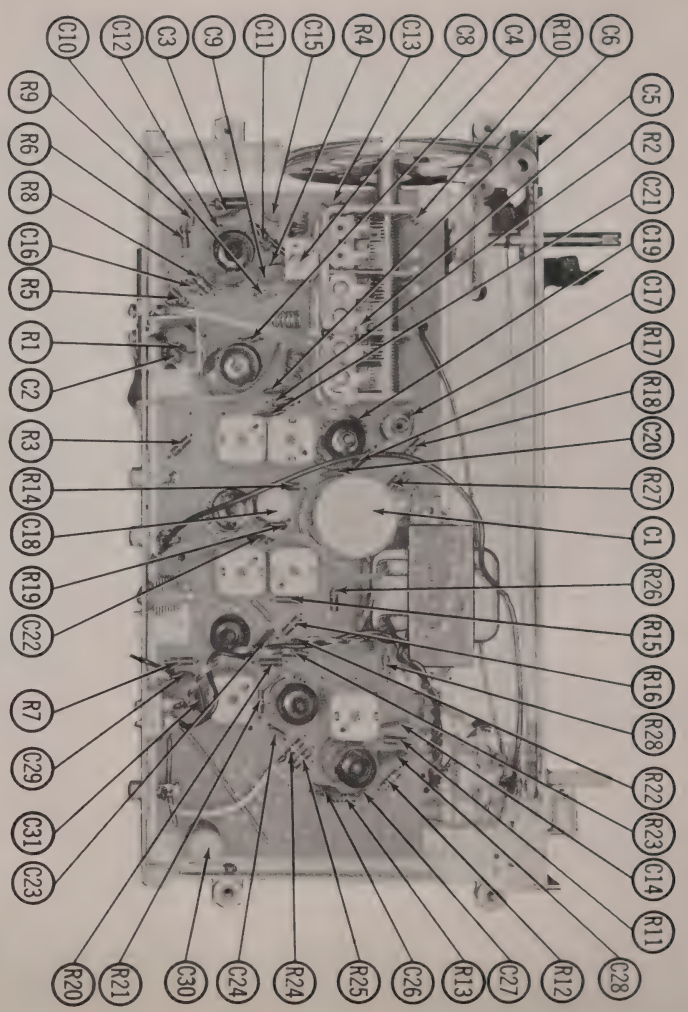
MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M8	Switch	370046	Function (Rotary Wafer Type)
M9	Switch		Speaker Selector (Rotary Wafer Type)
M10	Motor		Drive
M11	Switch		Off-On (Part of Changer)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUNER CHASSIS - TOP VIEW



PHOTOFACT® Folder

TRUETONE
MODEL DC3084A

TRADE NAME	Truetone Model DC3084A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Mo.
TYPE SET	Battery Operated Transistorized Portable AM Receiver.
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	540 -- 1650KC RATING 16MA@9 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3,..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A4, A6..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A5..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to base of Converter. Low side of chassis.	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	Loop	1650KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	540KC	Tuning gang fully closed.	"	A5	"
4.	"	1400KC	1400KC	"	A6	"
5.	"	600KC	Tune to 600KC Signal.	"		Retouch A5 for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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TRUETONE
MODEL DC3084A

TRUETONE
MODEL DC3084A

SET495 FOLDER 18

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N485	Converter		2N412	2N485	2N374	PNP
X2	CK879	Overload & AVC		2N410	CK879	2N406	PNP
X3	2N483	IF Amplifier		2N410	2N483	2N139	PNP
X4	CK879	Detector		2N410	CK879	2N406	PNP
X5	2N482	Driver		2N410	2N482	2N410	PNP
X6	2N631*	Output		2N408	2N631	2N408	PNP

* Type 2N632 may be used in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	25	10	150-133	XPP10025	EC25-10	TT10X25	ML30-15	TE-1118	
C2	50	10	150-134	XPP10050	EC50-10	TT10X50	ML50-15	TE-1119	
C3	10	10		XPP10010	EC10-10	TT12X10	ML10-15	TE-1114	①
C4	25	10	150-133	XPP10025	EC25-10	TT10X25	ML30-15	TE-1118	
C5	80	10		PWE10100	EC100-10	TT15X100	ML100-15	TE-1119.3	②
C6	80	10		PWE10100	EC100-10	TT15X100	ML100-15	TE-1119.3	②

① Some versions may use 12mfd Part #150-132.
② Some versions may use 100mfd Part #150-148.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C9	50000		BPD-05	DD-503	H-05S5	DP-2-503	GP150	5HK-S50
C10	4.7 NPO ± .25mmf		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CN7-547	10TCC-V47
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C14	3.5 NPO ± .25mmf		NPO-DI 3.3	DTZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C15	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C16	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C17	50000		BPD-05	DD-503	H-05S5	DP-2-503	GP150	5HK-S50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	10K	½	120-134①	B-15	A47-10K-Z	Q13-116	U18	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On

① Some versions may use 5000Ω (Part #120-164).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

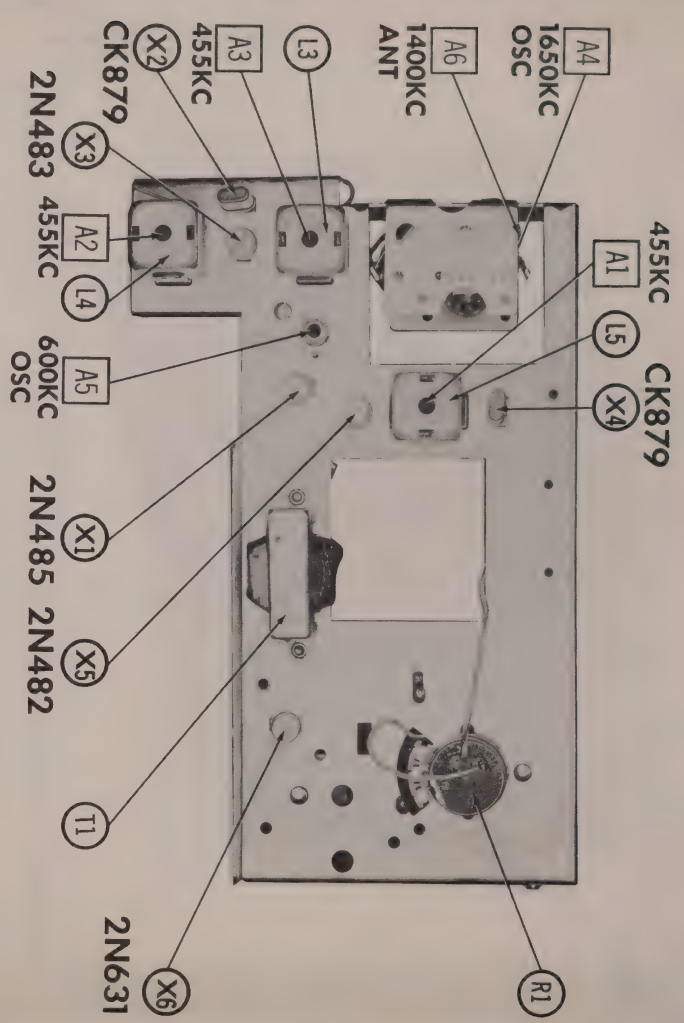
ITEM No.	RATING	REMARKS
R2	2200Ω	
R3	33K	
R4	1000Ω	
R5	1000Ω	
R6	180K	(120K) *
R7	10K	

ITEM No.	RATING	REMARKS
R8	220Ω	
R9	1500Ω	
R10	12K	
R11	220Ω	(470Ω) *
R12	1500Ω	
R13	2200Ω	

ITEM No.	RATING	REMARKS
R14	470Ω	
R15	1500Ω	
R16	10K	
R17	68Ω	

* Alternate Value.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TRUETONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	132-134			BC-419			
L2	Osc. Coil	136-146						
L3	1st IF Trans.	130-139						
L4	2nd IF Trans.	130-140						
L5	3rd IF Trans.	130-141						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	650Ω	3-4Ω	138-127							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	175-112	4A07	

BATTERIES

ITEM No.	VOLTAGE	TRUETONE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	3B6731 *		1*		635 *		M-14R*	* 6 Required

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M2	Tuning Cap. Earphone	160-129A 3DW5300	2 Gang (Ant. 23-270mmf, Osc. 23-126mmf)

CABINETS & CABINET PARTS

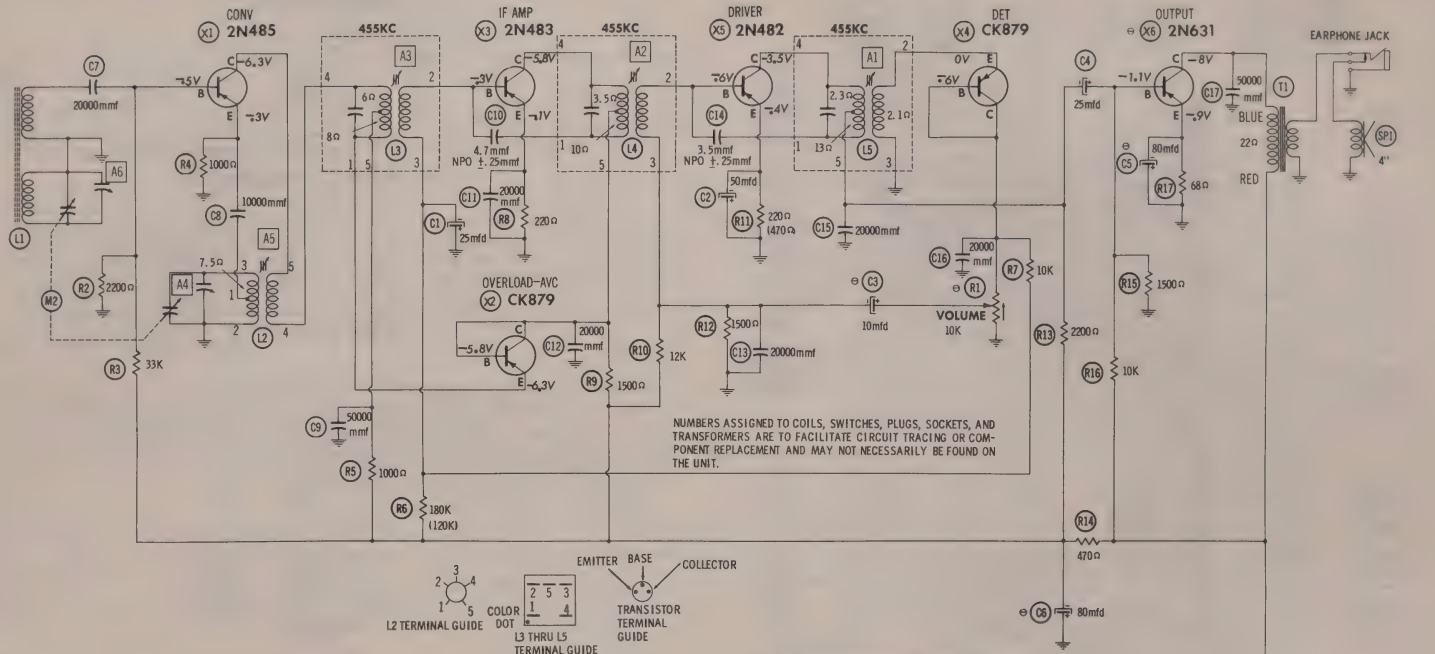
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob Knob Cabinet	220-152B 220-155A 210-173	Tuning Volume

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW



RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N485	2200Ω	1000Ω	†1500Ω
X2	2N483	15K	220Ω	†2000Ω
X3	2N482	1400Ω	220Ω	†2700Ω
X4	2N631	1500Ω	68Ω	†22Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R14 AND R16.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

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TRUETONE
MODEL DC3084A

PHOTOFACT® Folder

ZENITH MODELS SFD283, SFD285, SFD288, SFD290, SFD2560, SFD2565, SFD2570, SFD2575, SFD2580 (Ch. 7D31, 9D24, 9D25)

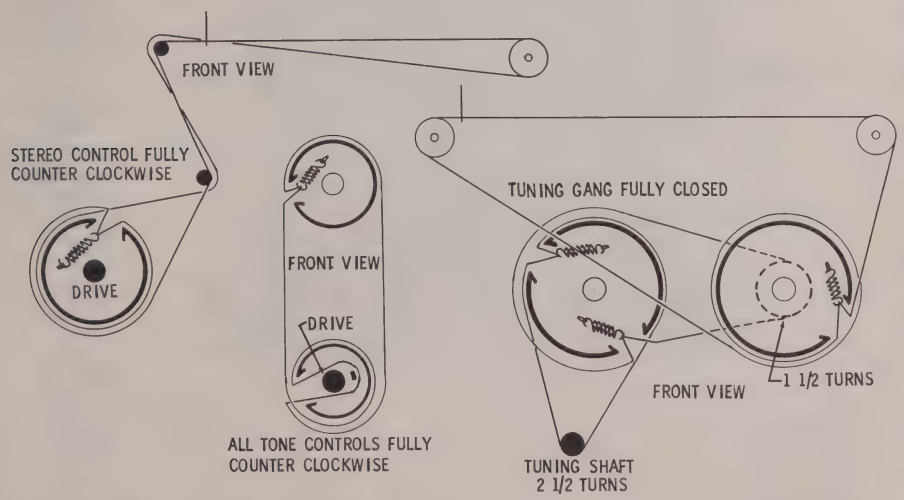
ZENITH MODELS SFD283, SFD285, SFD288, SFD290, SFD2560, SFD2565, SFD2570, SFD2575, SFD2580 (Ch. 7D31, 9D24, 9D25)

MODEL SFD2560W

ZENITH MODELS SFD283, SFD285, SFD288, SFD290, SFD2560, SFD2565, SFD2570, SFD2575, SFD2580 (Ch. 7D31, 9D24, 9D25)

TRADE NAME	Zenith Models	SFD283H, SFD283R, SFD283W, SFD285M, SFD285R, SFD288E, SFD288R, SFD288W, SFD290H, SFD290R, SFD2560E, SFD2560R, SFD2560W, SFD2565M, SFD2565R (Tuner Ch. 9D24, Amp. Ch. 7D31) SFD2570E, SFD2570W, SFD2570Y, SFD2575L, SFD2580H, SFD2580R (Tuner Ch. 9D25, Amp. Ch. 7D31)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois	
TYPE SET	AC Operated	9 Tube FM-AM Tuner and Stereo Preamplifier, 7 Tube Stereo Amplifier, and 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING 180 Watts, 1.8 Amp. @117 Volts AC
TUNING RANGE — BROADCAST	535 - 1750KC	FREQ. MOD. 88 - 108MC

DIAL CORD STRINGING



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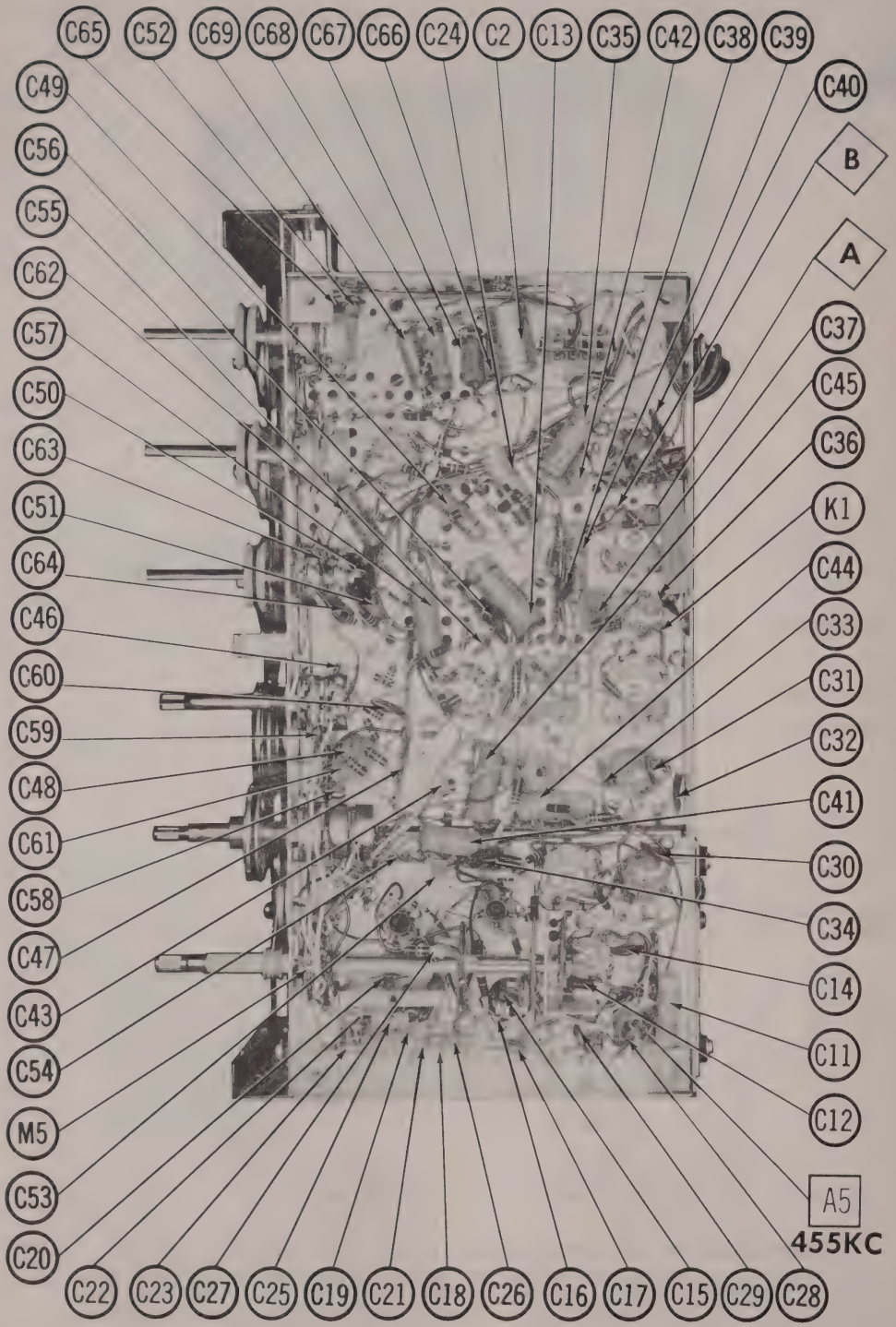
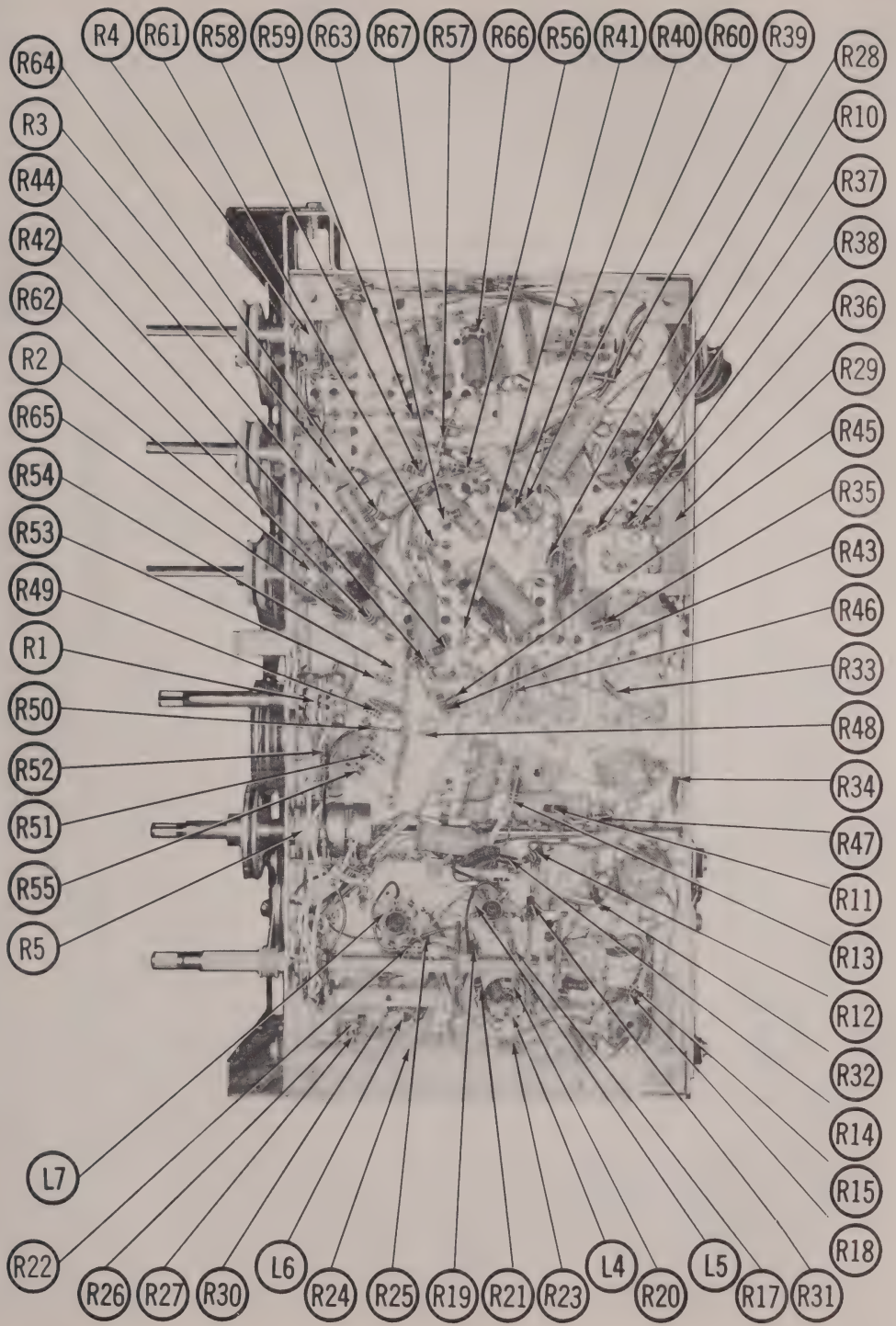
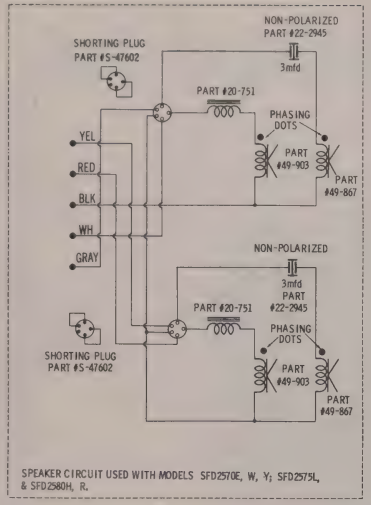
SET 495 FOLDER 19



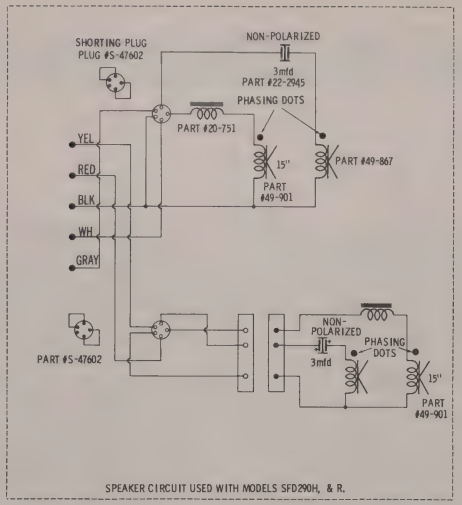
TUNER CHASSIS BOTTOM VIEW—CAPACITOR, MISC. & ALIGNMENT IDENT.



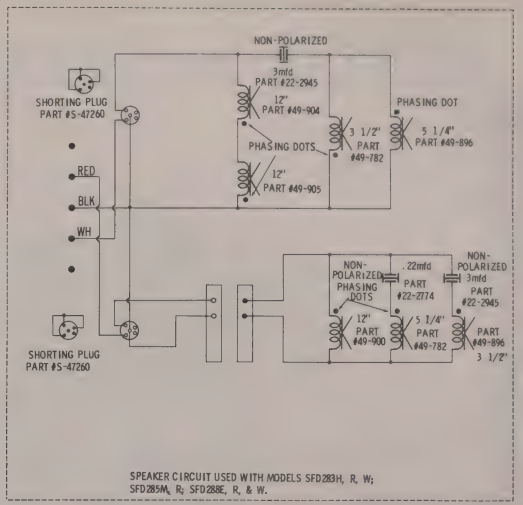
TUNER CHASSIS BOTTOM VIEW—RESISTOR & INDUCTOR IDENT.



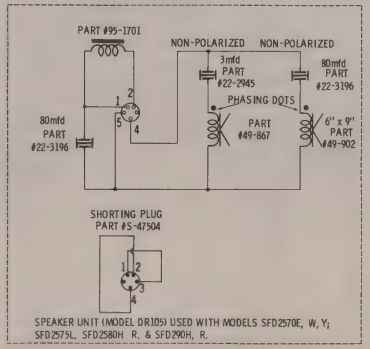
SPEAKER CIRCUIT USED WITH MODELS SFD2570E, W, Y; SFD2575L, & SFD2580H, R.



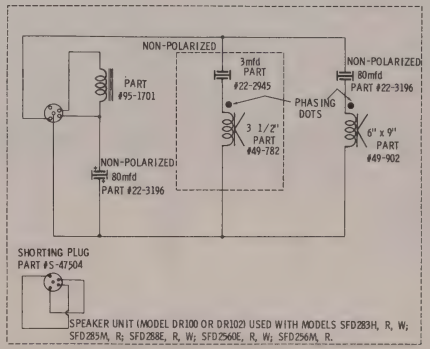
SPEAKER CIRCUIT USED WITH MODELS SFD290H, & R.



SPEAKER CIRCUIT USED WITH MODELS SFD283H, R, W; SFD285M, R; SFD288E, R, & W.



SPEAKER UNIT (MODEL DR105) USED WITH MODELS SFD2570E, W, Y; SFD2575L, SFD2580H R. & SFD290H, R.



SPEAKER UNIT (MODEL DR100 OR DR102) USED WITH MODELS SFD283H, R, W; SFD285M, R; SFD288E, R, W; SFD2560E, R, W; SFD256M, R.

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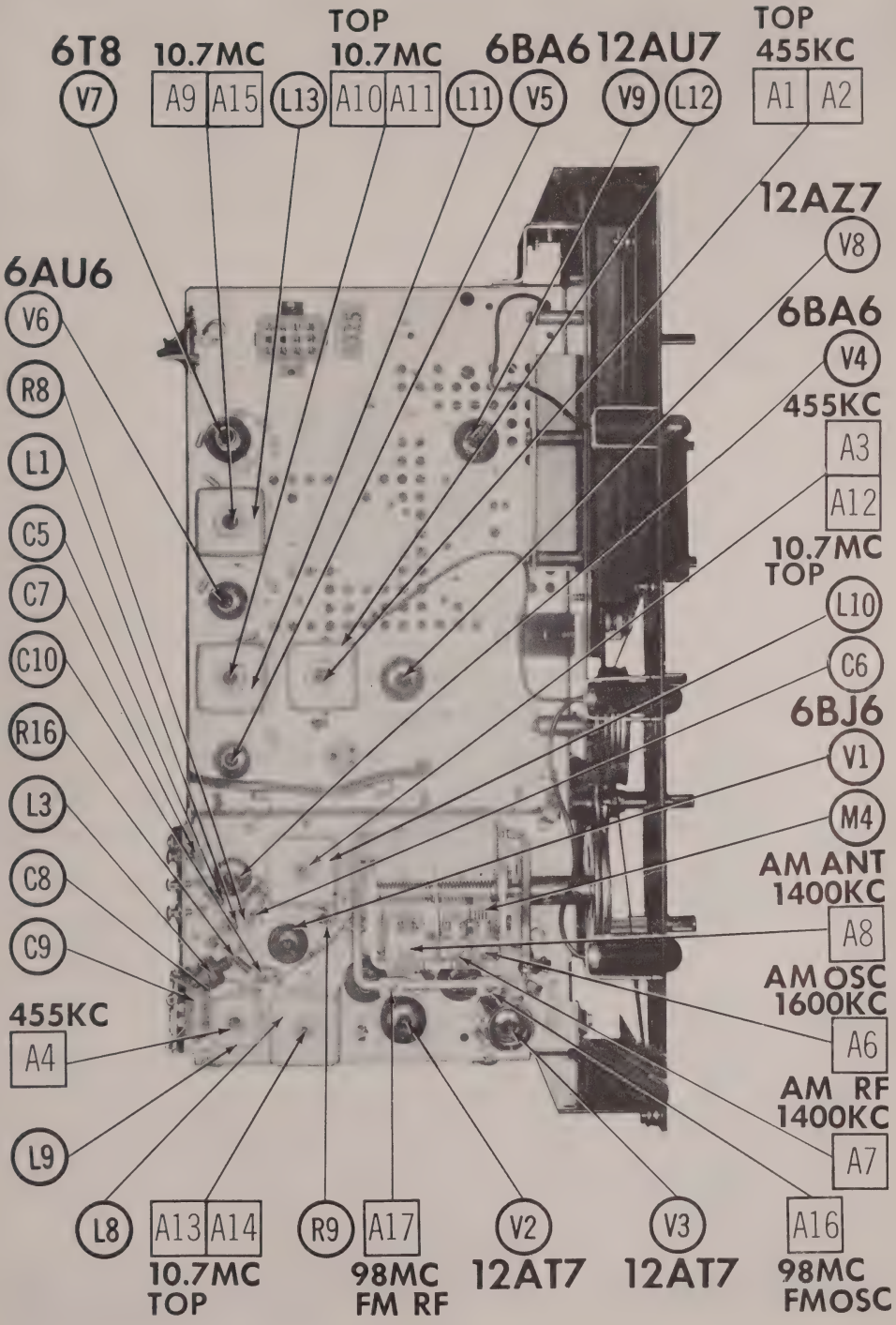
ZENITH MODELS SFD283, SFD285, SFD288, SFD290, SFD2560, SFD2565, SFD2570, SFD2575, SFD2580 (Ch. 7D31, 9D24, 9D25)

SPEAKER CIRCUITS



TUNER CHASSIS—TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested alignment tools: A1 thru A5, A9 thru A15.....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A6, A7, A8.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT – SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side to pin 7 (grid) of Mixer. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4, A5	Adjust for maximum output.
2.	Loop	1600KC	1600KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	Tune to 1400KC signal.	"	A7, A8	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .05mfd to pin 7 (grid) of Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe thru 1meg to point Ⓐ. Common to chassis.	A9, A10, A11, A12, A13, A14	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .05mfd to pin 7 (grid) of Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. thru 27K to point Ⓐ. Low side to chassis.	A9, A10, A11, A12, A13, A14	Adjust for maximum gain and symmetry of response similar to Fig 1.
5.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT – SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	High side thru 270Ω to FM antenna terminal. Low side to chassis.	98MC (Unmod.)	(FM) 98MC	DC probe to point Ⓐ. Common to chassis.	A16, A17	Adjust for maximum deflection.

FIG. 1

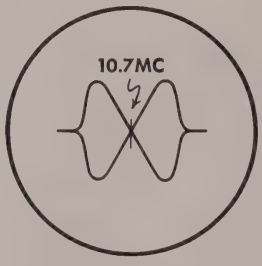
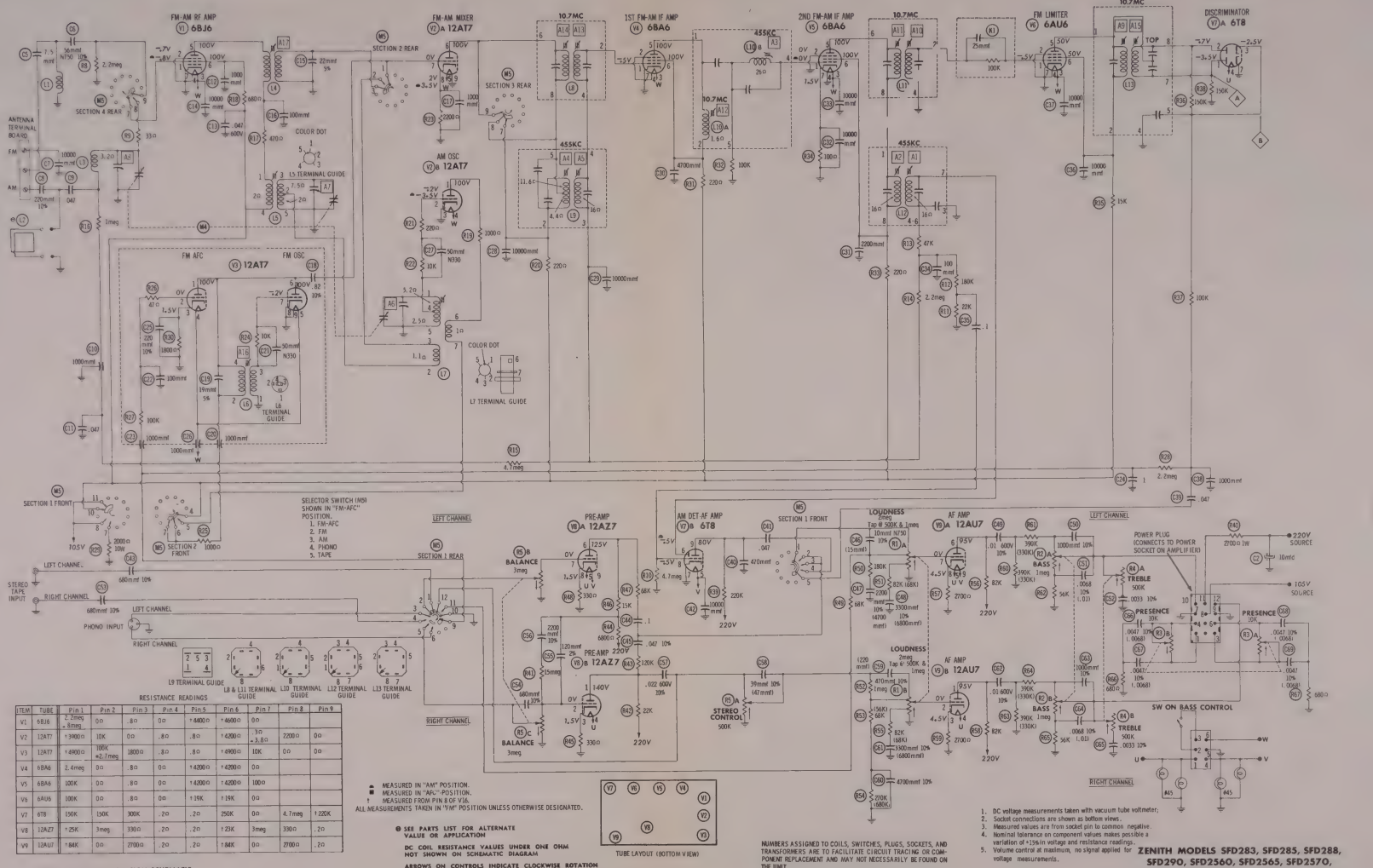


FIG. 2



ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BJ6	2.2meg + 8meg	0Ω	.8Ω	0Ω	↑4400Ω	↑4600Ω	0Ω		
V2	12AT7	↑3900Ω	10K	0Ω	.8Ω	↑4200Ω	.3Ω ±.8Ω		2200Ω	0Ω
V3	12AT7	↑4900Ω	100K ±2.7meg	1800Ω	.8Ω	.8Ω	↑4900Ω	10K	0Ω	0Ω
V4	6BA6	2.4meg	0Ω	.8Ω	0Ω	↑4200Ω	↑4200Ω	0Ω		
V5	6BA6	100K	0Ω	.8Ω	0Ω	↑4200Ω	↑4200Ω	100Ω		
V6	6AU6	100K	0Ω	.8Ω	0Ω	↑19K	↑19K	0Ω		
V7	6T8	150K	150K	300K	.2Ω	.2Ω	250K	0Ω	4.7meg	↑220K
V8	12AZ7	↑25K	3meg	330Ω	.2Ω	.2Ω	↑23K	3meg	330Ω	.2Ω
V9	12AU7	↑84K	0Ω	2700Ω	.2Ω	.2Ω	↑84K	0Ω	2700Ω	.2Ω

RESISTANCE READINGS

▲ MEASURED IN "AM" POSITION.
■ MEASURED IN "AFC" POSITION.
↑ MEASURED FROM PIN 8 OF V1A.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

TUBE LAYOUT (BOTTOM VIEW)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

ZENITH MODELS SFD283, SFD285, SFD288, SFD290, SFD2560, SFD2565, SFD2570, SFD2575, SFD2580 (Ch. 7D31, 9D24, 9D25)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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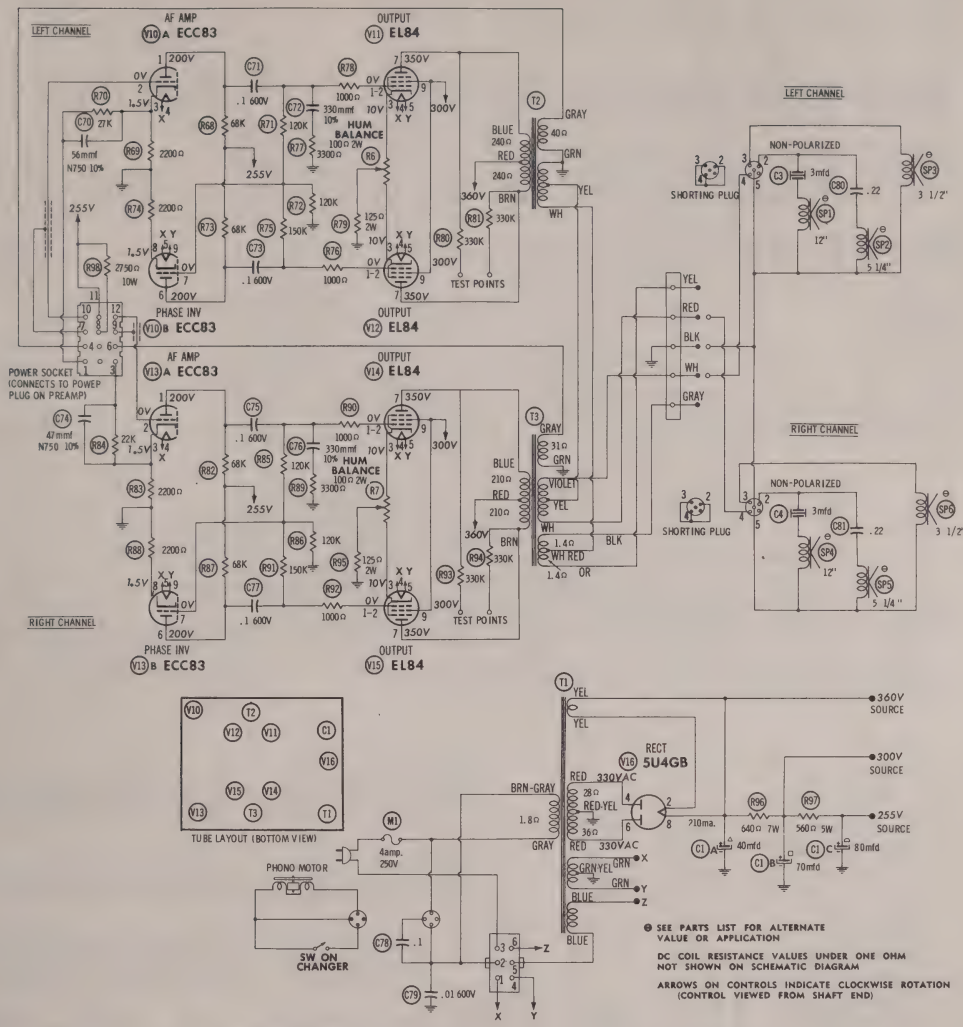
TUNER & PREAMP. SCHEMATIC



RESISTANCE READINGS (CONT.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V10	ECC83 12AX7	†68K	56K	2200Ω	.2Ω	.2Ω	†69K	120K	2200Ω	.2Ω
V11	EL84 6BQ5	240K	240K	175Ω	.2Ω	.2Ω	NC	†240Ω	NC	†640Ω
V12	EL84 6BQ5	270K	270K	175Ω	.2Ω	.2Ω	NC	†240Ω	NC	†640Ω
V13	ECC83 12AX7	†69K	56K	2200Ω	.2Ω	.2Ω	†69K	120K	2200Ω	.9Ω
V14	EL84 6BQ5	240K	240K	175Ω	.2Ω	.2Ω	NC	†210Ω	NC	†640Ω
V15	EL84 6BQ5	270K	270K	175Ω	.2Ω	.2Ω	NC	†210Ω	NC	†640Ω
V16	5U4GB	NC	¶	TP	30Ω	NC	28Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.

† MEASURED FROM PIN 8 OF V16.

NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

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ZENITH MODELS SFD283, SFD285, SFD288, SFD290, SFD2560, SFD2565, SFD2570, SFD2575, SFD2580 (Ch. 7D31, 9D24, 9D25)

AMP. SCHEMATIC

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amp. -AM RF Amp.	6BJ6
V2	FM AM Mixer-AM Osc.	12AT7
V3	FM Osc. - FM AFC	12AT7
V4	1st FM-AM IF Amp.	6BA6
V5	2nd FM-AM IF Amp.	6BA6
V6	FM Limiter	6AU6
V7	Discriminator-AM Det. - AF Amp.	6T8
V8	Left Channel Preamp. - Right Channel Preamp.	12AZ7
V9	Left Channel AF Amp. - Right Channel AF Amp.	12AU7
V10	Left Channel AF Amp. - Left Channel Phase Inv.	ECC83/12AX7
V11	Left Channel Output	EL84/6BQ5
V12	Left Channel Output	EL84/6BQ5
V13	Right Channel AF Amp. - Right Channel Phase Inv.	ECC83/12AX7
V14	Right Channel Output	EL84/6BQ5
V15	Right Channel Output	EL84/6BQ5
V16	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	22-3099			FP264.5		TVLS-3793.5*	
B	■70	450				TC80			
C	▲80	450							
C2	10	300	22-3133	PRS1620	BR1045	TC62	TD-10-450	TVA-1604	
C3	3	30NP	22-2945	NP-PRS7405	BBR4-150	TCN503		TVANS-1215 *	
C4	3	30NP	22-2945	NP-PRS7405	BBR4-150	TCN503		TVANS-1215 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	7.5			DD-7R5	L10V8		GP580	10TS-V75
C6	56 N750 10%			TCN-56	C10Q56U	CCTN-560	CN7-456	10TCU-Q56
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C9	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C10	1000		EF-001	MFT-1000		CCF-102	CT280A	
C11	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C12	1000		SI 1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C13	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	22 5%			TCZ-22	C10Q22	CM-19B-220J	CNO-422	10TCC-Q22
C16	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C17	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C18	.82 10%	#22-3031						
C19	19 5%			TCZ-20	C10Q20C	CM-19B-200J	CNO-418	10TCC-Q20
C20	1000		EF-001	MFT-1000		CCF-102	CT280A	
C21	50 N330			TCA-47		*		10TCS-Q47
C22	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C23	1000		EF-001	MFT-1000		CCF-102	CT280A	
C24	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C25	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C26	1000		EF-001	MFT-1000		CCF-102	CT280A	
C27	50 N330			TCA-47		*		10TCS-Q47
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C31	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C34	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	10TS-T10
C35	.1 200V		P288N-1	DF-101	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C36	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C38	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C39	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C40	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C41	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C42	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C43	680 10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C44	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C45	.047 200V 10%		V84C2S47-10%		PM2S47	4DP-3-473	GEM-1615	2TM-S47
C46	10 N150 10%	(15) †				*		10TCP-Q10
C47	2200 10%	(4700) †	DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C48	3300 10%	(6800) †	DI-3300		PM6D33	CCD-332	JL233	10TS-D33
C49	.01 600V 10%		V84C6P1-10%		PM6S1	6DP-2-103	GEM-1611	6TM-S1
C50	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C51	.0068 200V 10%	(.01) †	V84C2D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C52	.0033 200V 10%		V84C4D33-10%		PM6D33	6DP-1-332	GEM-16233	6TM-D33
C53	680 10% *		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C54	680 10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C55	120 2%	#22-3097				VCM-20-121G		
C56	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C57	.022 600V 10%		V84C6S22-10%		PM6S22	6DP-2-223	GEM-16122	6TM-S22
C58	39 10%	(47) †	NPO-SI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C59	470 10%	(220) †		DD-471	5R5T47	CCD-471	GP347	10TS-T47
C60	4700 10%		DI-4700		PM6D47	CCD-472	JL247	10TS-D47
C61	3300 10%	(6800) †	DI-3300		PM6D33	CCD-332	JL233	10TS-D33
C62	.01 600V 10%		V84C6S1-10%		PM6S1	6DP-2-103	GEM-1611	6TM-S1
C63	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C64	.0068 200V 10%	(.01) †	V84C2D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C65	.0033 200V 10%		V84C4D33-10%		PM6D33	6DP-1-332	JL233	6TM-D33
C66	.0047 200V 10%	(.0068) †	V84C2D47-10%		PM6D47	6DP-1-472	JL247	6TM-D47
C67	.0047 200V 10%	(.0068) †	V84C2D47-10%		PM6D47	6DP-1-472	JL247	6TM-D47
C68	.0047 200V 10%	(.0068) †	V84C2D47-10%		PM6D47	6DP-1-472	JL247	6TM-D47
C69	.0047 200V 10%	(.0068) †	V84C2D47-10%		PM6D47	6DP-1-472	JL247	6TM-D47
C70	56 N750 10%			TCN-56	C10Q56U	CCTN-560	CN7-456	10TCU-Q56
C71	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C72	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C73	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C74	47 N75 10%							
C75	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C76	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C77	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C78	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C79	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C80	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C81	.22 200V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22

† Value used in Chassis 9D24.
# Zenith Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg *		63-4631	BT-175				Loudness, Right Channel
B	2meg *			STR-175				Loudness, Left Channel
R2A	1meg		63-4460					Bass, Right Channel
B	1meg							Bass, Left Channel
C	Switch							Push-Pull Off-On
R3A	10K		63-4411	B-13			FA14L	Presence, Left Channel
B	10K			SR-13			RU14L	Presence, Right Channel
C	Shaft			Not Req.			CS3500	
R4A	500K		63-4410	B-60	AD47-500K-Z		FA55A	Treble, Left Channel
B	500K			SR-60	Not Req.		RU55A	Treble, Right Channel
C	Shaft			Not Req.	FS-3		CS3500	
R5A	500K		63-4632					Stereo Control
B	1meg							Balance, Left Channel
C	1meg							Balance, Right Channel
R6A	100Ω	2(WW)	63-4468	WN-101	A43-100	WPK100	R100L	Hum Balance, Left Channel
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R7A	100Ω	2(WW)	63-4468	WN-101	A43-100	WPK100	R100L	Hum Balance, Right Channel
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

* Taps @ 500K and 1meg.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R8	2.2meg	
R9	33Ω	
R10	4.7meg	
R11	22K	
R12	180K	
R13	47K	
R14	2.2meg	
R15	4.7meg	
R16	1meg	
R17	470Ω	
R18	680Ω	
R19	1000Ω	
R20	220Ω	
R21	220Ω	
R22	10K	
R23	2200Ω	
R24	10K	
R25	1000Ω	
R26	47Ω	
R27	100K	
R28	2.2meg	
R29	2000Ω 10W	
R30	1800Ω	
R31	220Ω	
R32	100K	
R33	220Ω	
R34	100Ω	
R35	15K	
R36	150K	
R37	100K	
R38	150K	

ITEM No.	RATING	REMARKS
R39	220K	
R40	2700Ω 1W	
R41	15meg	
R42	22K	
R43	120K	
R44	6800Ω	
R45	330Ω	
R46	15K	
R47	68K	
R48	330Ω	
R49	68K	
R50	180K	
R51	82K	(68K) *
R52	1meg	
R53	68K	(56K) *
R54	270K	(680K) *
R55	82K	(68K) *
R56	82K	
R57	2700Ω	
R58	82K	
R59	2700Ω	
R60	390K	(330K) *
R61	390K	(330K) *
R62	56K	
R63	390K	(330K) *
R64	390K	(330K) *
R65	56K	
R66	680Ω	
R67	680Ω	
R68	68K	
R69	2200Ω	

ITEM No.	RATING	REMARKS
R70	27K	
R71	120K	
R72	120K	
R73	68K	
R74	2200Ω	
R75	150K	
R76	1000Ω	
R77	3300Ω	
R78	1000Ω	
R79	125Ω 2W	
R80	330K	
R81	330K	
R82	68K	
R83	2200Ω	
R84	22K	
R85	120K	
R86	120K	
R87	68K	
R88	2200Ω	
R89	2300Ω	
R90	1000Ω	
R91	150K	
R92	1000Ω	
R93	330K	
R94	330K	
R95	125Ω 2W	
R96	640Ω 7W	
R97	560Ω 5W	
R98	2750Ω 10W	

* Value used in Chassis 9D24.

COILS (RF-IF)

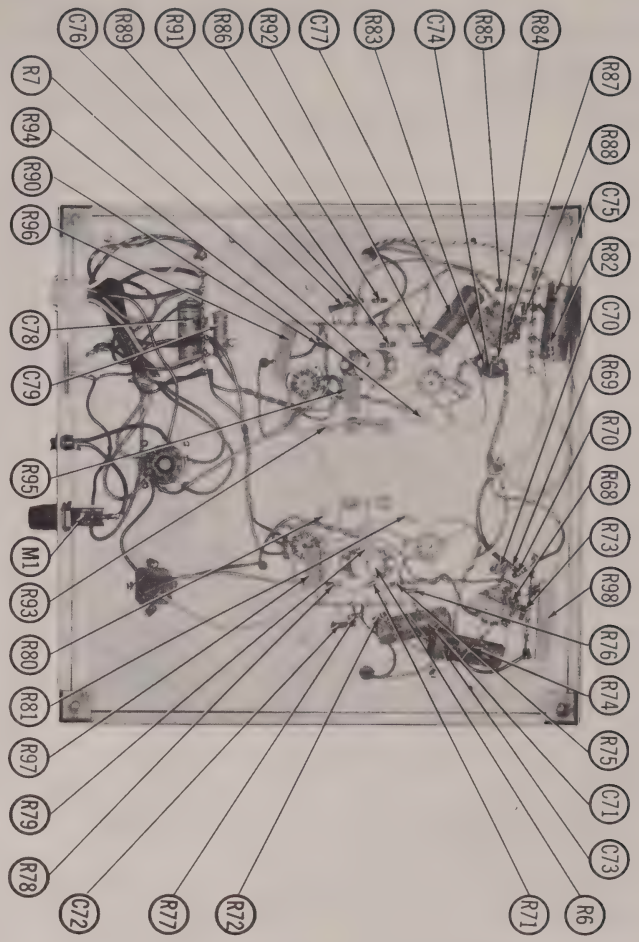
ITEM No.	USE	REPLACEMENT DATA						NOTES
		ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil	20-355	19-1000	19-1000	BC-561	4602		1uh
L2	Loop Ant.	S-17325①						
L3	AM Ant. Coil	S-18812	19-4201	19-4201	TV-197	6154	VP-5	207uh
L4	FM RF Coil	S-15743						
L5	AM RF Coil	S-41088						
L6	FM Osc. Coil	S-15691						
L7	AM Osc. Coil	S-41087						
L8	1st FM IF Trans.	95-1150	16-3487 *	16-3487 *	FM-251 ▲	1451 ▲		
L9	1st AM IF Trans.	95-1549						
L10A	2nd FM IF Trans.	95-1251						
B	2nd AM IF Trans.							
L11	3rd FM IF Trans.	95-1150	16-3487 *	16-3487 *	FM-251 ▲	1451 ▲		
L12	3rd AM IF Trans.	95-1102	16-6770 *	16-6770 *	BC-355 *	12-C6 *		
L13	Discriminator	95-1153						

① Part #S-17917 used in Model SFD290 Series.
* Remove Center Bolt Mtg. Plate and Use Adapter Plate.
▲ Enlarge Mtg. Holes.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ 1.8A	660 VCT @ .210A	5V@ 3A	95-1638						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT @ 4.5A	6.3V@ 1.8A								

AMP CHASSIS—BOTTOM VIEW



ZENITH MODELS SFD283, SFD285, SFD288, SFD290, SFD2560, SFD2565, SFD2570, SFD2575, SFD2580 (Ch. 7D31, 9D24, 9D25)

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PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7600Ω CT	52Ω	95-1691							
		SEC. 2								
		16Ω Tap @ 6-8Ω								
T3	PRI. 6800Ω CT	SEC. 1 57Ω	95-1692							
		SEC. 2 12-16Ω CT								
		SEC. 3 32Ω CT								

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	49-903	12A6AZ6.4	See Schematic for speaker types used on all models.
SP2	5 1/4"	PM	3-4Ω	49-896	52A1	
SP3	3 1/2"	PM	10-12Ω	49-782	3A15TZ12	
SP4	12"	PM	6-8Ω	49-903	12A6AZ6.4	
SP5	5 1/4"	PM	3-4Ω	49-896	52A1	
SP6	3 1/2"	PM	10-12Ω	49-782	3A15TZ12	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K1	Limiter Grid Filter	25mmf, 100K	105-42	Sprague PRC-11

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	4A 250V	136-31	62-17	312004 (3AG 4A 250V)	342001	MTH4	HKP

PHONO CARTRIDGE

ITEM No.	ZENITH PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	142-92 † or 142-93 †♦	13TB or 13TBX		26S or 26SD	S1-1 S3-3	53 or 55		8TA4-S or 8TA4-SD	N-8TA-S or N-8TA-SD

† Includes dual-sapphire needles.
♦ Includes diamond-sapphire needles.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA ZENITH PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M3	(Part of M2)	W-101STS † or W-101STD ♦ and W-102MGS † or W-102MGD ♦		† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M4	Tuning Cap	22-2944	AM, 3 Gang (Ant. —24-380mmf, RF 13-206mmf, Osc. 18-90mmf)
M5	Switch	85-633	Model Selector

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	S-44166	Tuning, with ring assembly
Knob	S-46162	Off-On Bass, Presence, Treble
Knob	46-2080	Bandswitch, Loudness
Knob	46-2284	Balance
Knob	46-2097	Stereo Control, Models SFD283W, R, H; SFD285R, M
Knob	46-2095	Stereo Control, Models SFD288W, R, E, SFD290R, H; SFD2560W, R, E; SFD2565M, R; SFD2570W, Y, E; SFD2575L; SFD2580R, H
Dial Scale	26-653	Models SFD283W, R, H; SFD285R, M
Dial Scale	26-652	Models SFD288W, R, E; SFD290R, H; SFD2560W, R, E; SFD2565M, R; SFD2570W, Y, E; SFD2575L; SFD2580R, H
Dial Crystal	192-254	Models SFD283W, R, H; SFD285R, M
Dial Crystal	192-286	Models SFD288E, R, W; SFD290R, H; SFD2560W, R, E; SFD2565M, R; SFD2570W, Y, E; SFD2575L; SFD2580R, H
Dial Pointer	59-341	
Stereo Balance Pointer	59-355	
Cabinet	14-2845H	Model SFD283H
Cabinet	14-2845R	Model SFD283R
Cabinet	14-2845W	Model SFD283W
Cabinet	14-2826M	Model SFD285M
Cabinet	14-2826R	Model SFD285R
Cabinet	14-2846E	Top Section, Model SFD288E
Cabinet	14-2846R	Top Section, Model SFD288R
Cabinet	14-2846W	Top Section, Model SFD288W
Cabinet	14-2478E	Base, Model SFD288E
Cabinet	14-2478R	Base, Model SFD288R
Cabinet	14-2478W	Base, Model SFD288W
Cabinet	14-2841H	Model SFD290H
Cabinet	14-2841R	Model SFD290R
Cabinet	14-2829E	Model SFD2560E
Cabinet	14-2829R	Model SFD2560R
Cabinet	14-2829W	Model SFD2560W
Cabinet	14-2830M	Model SFD2565M
Cabinet	14-2830R	Model SFD2565R
Cabinet	14-2843E	Model SFD2570E
Cabinet	14-2843W	Model SFD2570W
Cabinet	14-2843Y	Model SFD2570Y
Cabinet	14-2844L	Model SFD2575L
Cabinet	14-2831H	Model SFD2580H
Cabinet	14-2831R	Model SFD2580R
Cabinet Leg	96-183	Model SFD288R
Cabinet Leg	96-184	Model SFD288E
Cabinet Leg	96-185	Model SFD288W
Cabinet Leg	96-193	Model SFD2560R
Cabinet Leg	96-194	Model SFD2560W
Cabinet Leg	96-195	Model SFD2560E

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

AGC CONTROL

To adjust **AGC** control, set other operating controls for normal operation. Set **Channel Selector** to strongest channel in your area. Adjust **AGC** control clockwise until overload occurs. Back off control setting until overload disappears. Check other channels for overload and readjust **AGC** if necessary.

CIRCUIT BREAKER

A circuit breaker with manual reset at rear of set is used in the receiver power supply for protection against current overload. If circuit breaker continues to open when "RESET" button is pushed, troubleshooting will be necessary to find the source of excess current.

HIGH VOLTAGE WARNING

High voltage is present at some points in this receiver. Operation of the set without the cabinet or with cabinet back removed involves shock hazard. Exercise necessary high voltage precautions.

Parts of receiver chassis are connected directly to one side of the 117 volt, 60 cycle power line. Depending upon the position of the line cord plug in the wall outlet, the total AC line voltage may exist between parts of chassis and a grounded object. When installing or servicing, do not touch the chassis unless adequate safety precautions are taken. Never touch the chassis and a ground (radiators, pipes, etc.) at the same time.

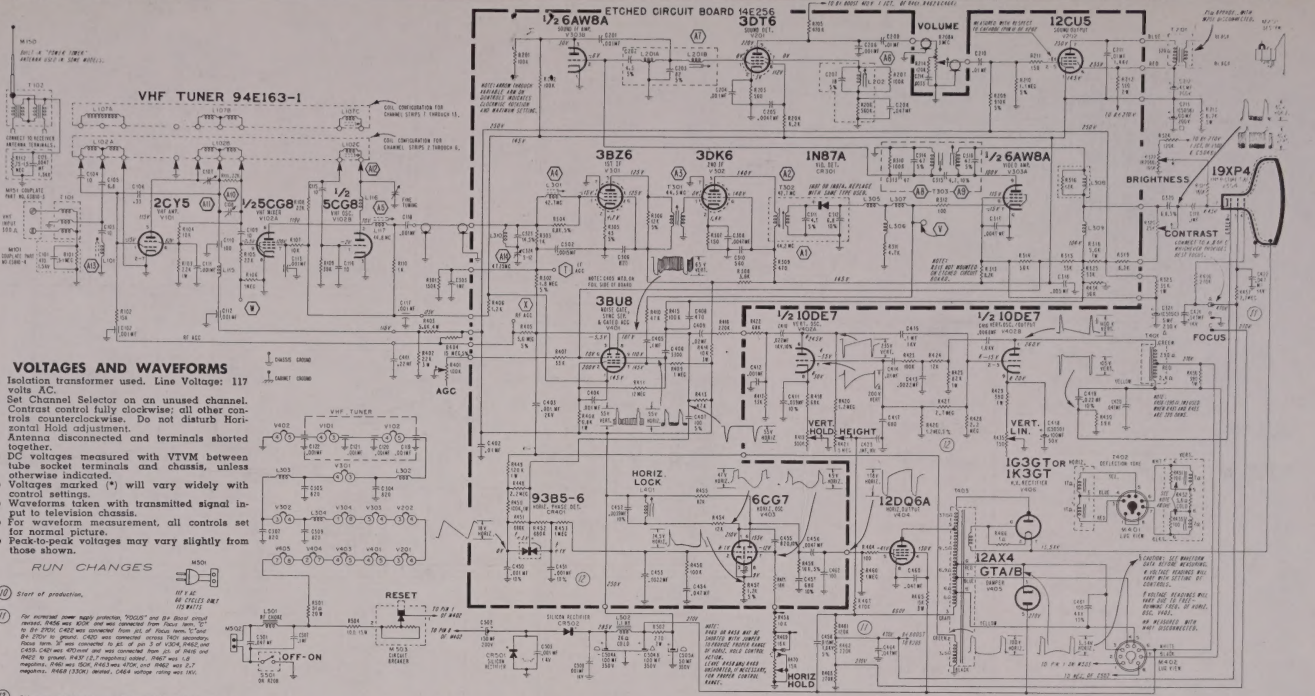
Do not ground chassis or connect test equipment directly to it unless an isolation transformer is used. If an isolation transformer is not available, a neon lamp can be used to determine if the chassis is "hot".

SCHEMATIC NOTES

Numbers and letters inside hexagons indicate alignment points.

Fixed resistor values shown in ohms ± 10% tolerance, ½ watt; capacitor values shown in micromicrofarads ± 20% unless otherwise specified.

NOTE: K = x 1000, MEG = x 1,000,000, MF = microfarad.



VOLTAGES AND WAVEFORMS

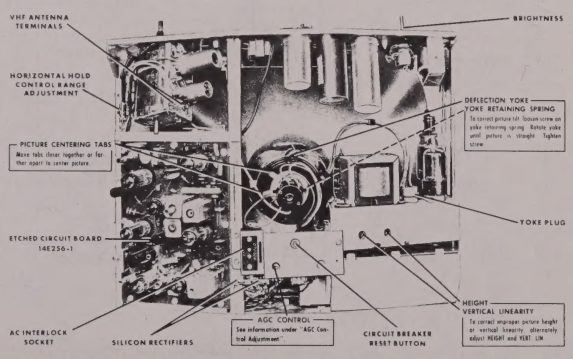
- Isolation transformer used. Line Voltage: 117 volts AC.
- Set Channel Selector on an unused channel. Contrast control fully clockwise; all other controls counterclockwise. Do not disturb Horizontal Hold adjustment.
- Antenna disconnected and terminals shorted together.
- DC voltages measured with VTVM between tube socket terminals and chassis, unless otherwise indicated.
- Voltages marked (*) will vary widely with control settings.
- Waveforms taken with transmitted signal input to television chassis.
- For waveform measurement, all controls set for normal picture.
- Peak-to-peak voltages may vary slightly from those shown.

RUN CHANGES

(10) Start of production.

(11) For increased power supply protection, "FOCUS" and B+ Boost circuit revised. R456 was 100K and was connected from Focus term. "E" to B+ 270V. C420 was connected from pin of Focus term. "L" and B+ 270V to ground. C420 was connected across T401 secondary. Focus term. "F" was connected to pin of pin 3 of V304, R462 and C459. C421 was 470 mmf and was connected from pin of R416 and R462 to ground. R437 (2.7 megohms) added. R467 was 1.8 megohms. R460 was 150K, R463 was 470K, and R462 was 2.7 megohms. R468 (330K) deleted. C464 voltage rating was 1KV.

(12) To improve Vertical Lock-in range centering, R426 changed to 1.2 meg. and, 5K, Ariz. C431 changed to 10% tolerance.


VHF ANTENNA TERMINALS
HORIZONTAL HOLD CONTROL RANGE ADJUSTMENT
PICTURE CENTERING TABS
Move tabs closer together or far- ther apart to center picture.
ETCHED CIRCUIT BOARD 14E256-1
AC INTERLOCK SOCKET
SILICON RECTIFIERS
AGC CONTROL
See information under "AGC Control Adjustment"
CIRCUIT BREAKER RESET BUTTON
HEIGHT—VERTICAL LINEARITY
To correct improper picture height or vertical linearity, alternately adjust HEIGHT and VERT. LIN.
YOKE PLUG
DEFLECTION YOKE YOKE RETAINING SPRING
To correct picture tilt: loosen screw on yoke retaining spring. Rotate yoke until picture is straight. Tighten screw.
BRIGHTNESS

ADMIRAL MODELS
PL19J131, PL19J133,
PL19J135, PL19J140,
PL19J141, PL19J149,
PL19UJ131, PL19UJ133,
PL19UJ135, PL19UJ140,
PL19UJ141, PL19UJ149
(CH. 15G1B, 15UG1B)

RESISTORS

Sym.	Description	Part No.
R208A	3 megohms, Volume } dual control	
R208B	100,000 ohms, Brightness } incl. sw. S501	75B 11-36
R320	25,000 ohms, Contrast	75D 20-122
R401	100,000 ohms, AGC	75D 20-118
R419	300,000 ohms, Vert. Hold	75D 20-120
R421	2.5 megohms, Height	75D 20-
R432	3.8 ohms (measured when cold) thermistor	61A 27
R435	750 ohms, Vert. Lin.	75D 20-124
R470	600,000 ohms, Horiz. Hold	75D 20-
R501	51 ohms, 20 watts	61B 3-34
R504	10 ohms, 15 watts	61B 1-58

CAPACITORS

Sym.	Description	Part No.
C202	4.5 mmf, 450 volts, 5%, comp.	65B 40-045
C203	82 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-98
C207	18 mmf, 500 volts, 5%, cer. disc, N220 temp. coeff.	65D 10-140
C208	.047 mf, 200 volts, molded, 4% drift, mylar dielec.	64C 16-55
C211	.01 mf, 1.4KV, cer. disc	65D 10-65
C212	40 mf, 200 volts, electrolytic	67A 4-21
C310	560 mmf, 500 volts, 5%, cer. disc, N3300 temp. coeff.	65D 10-159
C314	47 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-92
C316	47 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-92
C320	6.8 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65B 27-068
C403	.001 mf, 2KV, cer. disc	65D 10-181
C405	.1 mf, 400 volts, molded, tubular	64B 8-76
C407	100 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-105
C410	.022 mf, 1KV, 10%, mylar dielec., 2% drift	64B 2-51
C411	.039 mf, 600 volts, 10%, mylar dielec., 2% drift	64C 26-25
C415	.1 mf, 1KV, molded	64B 2-52
C416	.0068 mf, 1.5KV, molded	64B 2-58
C421	.1 mf, 1KV, molded	64B 2-52
C422	.047 mf, 1KV, molded	64B 2-30
C452	.0039 mf, 500 volts, 10%, mica	65B 21-392
C455	820 mmf, 300 volts, 10%, mica	65B 21-821
C457	680 mmf, 500 volts, 10%, mica	65B 21-681
C458	.022 mf, 1.6KV, molded	64B 2-43
C459	.047 mf, 1KV, molded	64B 2-30
C501	.047 mf, 1KV	63B 12-7
C502	150 mf, 200 volts, electrolytic	67D 15-234
C504A	100 mf, 350 volts } electro-	
C504B	100 mf, 350 volts } lytic	67D 15-331
C505A	50 mf, 350 volts	
C505B	60 mf, 200 volts } electro-	
C505C	5 mf, 200 volts } lytic	67D 15-333
C505D	100 mf, 50 volts	

COILS AND TRANSFORMERS

Sym.	Description	Part No.
L201	Phase Shift and Sound IF coil	72B 208-1
L202	Quadrature Coil	72B 132-37
L301	IF Input Coil	72C 132-41
L305	RF Choke Coil (Orange dot)	73B 31-4
L306	Video Peaking Coil	73B 5-20
L307	Resonant Choke Coil (Yellow dot)	73B 31-3
L308	Video Peaking Coil	73B 5-39
L309	Video Peaking Coil	73B 5-34
L310	Trap Coil	73B 37-3
L401	Horizontal Lock Coil	94D 17-14
L501	RF Choke Coil	73B 31-1
L502	Filter Choke (1.1 henry)	74C 18-33
T201	Audio Output Transformer	79D 33-28
T301	1st IF Transformer	72C 132-42
T302	2nd IF Transformer	72B 207-2
T303	Sound Take-Off Transformer	72C 185-2
T401	Vertical Output Transformer	79B 43-20
T402	Deflection Yoke (less picture centering device & yoke cap)	94D 189-2
T403	Horizontal Output Transformer	79D 83-5

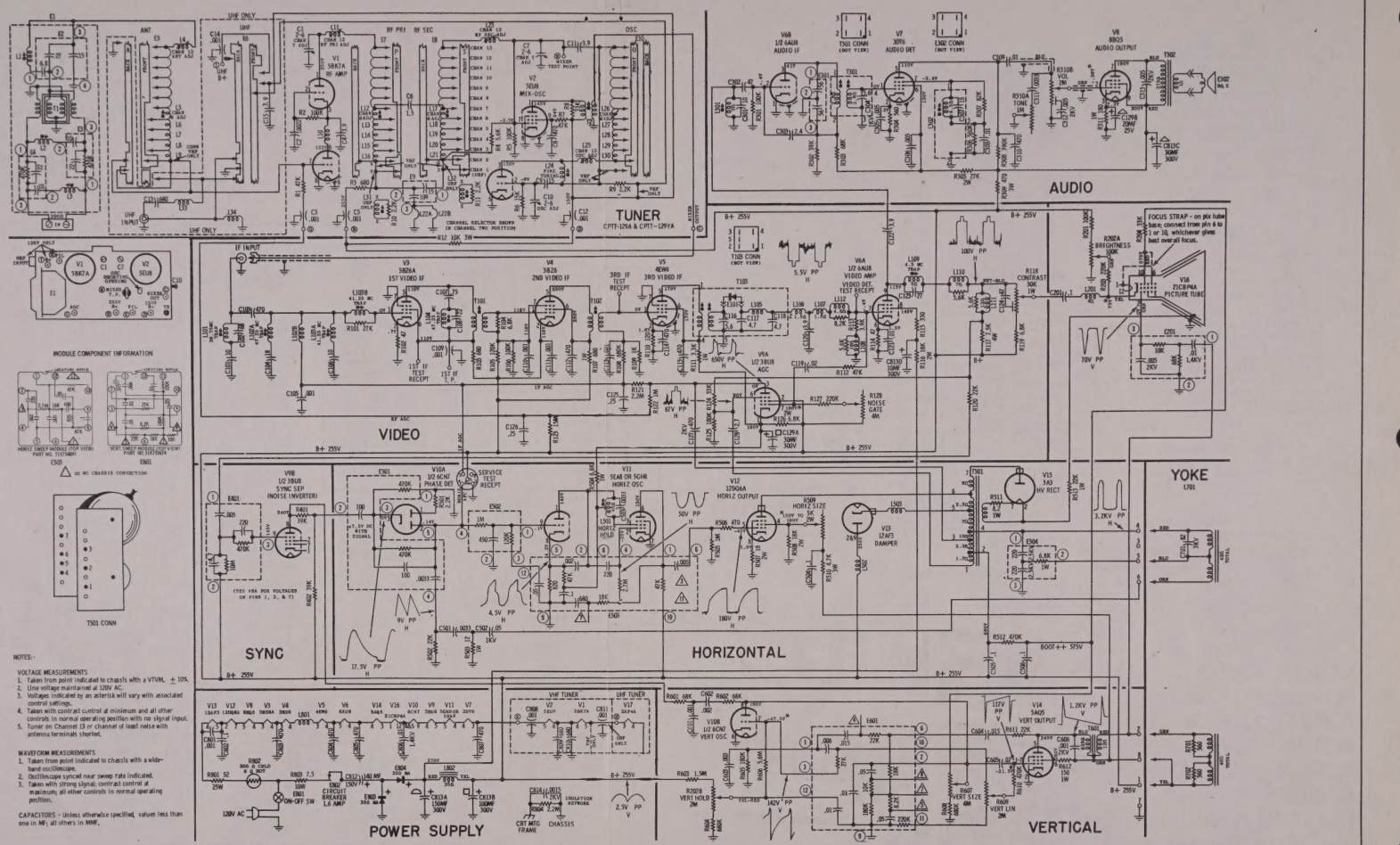
MISCELLANEOUS CHASSIS PARTS

CR301	Video Detector	1N87 or 1N87A
CR401	Diode, Dual Selenium	93B 5-6
CR501	Rectifier, Silicon (500 MA)	93B 12-1
CR502	Rectifier, Silicon (500 MA)	93B 12-1
M151	Couplate (includes R112 and C123)	63B 10-3
M201	Speaker, 3x5" PM	
M503	Circuit Breaker	84A 17-4
	Picture Centering Device and Yoke Cap	94C 152-3

Schematic Diagram Courtesy of Admiral Corporation

← ADMIRAL

MOTOROLA ↓


TUNER
CPTT-129A & CPTT-129YA
AUDIO
VIDEO
SYNC
HORIZONTAL
YOKE
POWER SUPPLY
VERTICAL
MODULE COMPONENT INFORMATION
T501 CONN
NOTES:-
VOLTAGE MEASUREMENTS
1. Taken from point indicated to chassis with a VTVM, ± 10%.
2. Line voltage maintained at 120V AC.
3. Voltages indicated by an asterisk will vary with associated control settings.
4. Taken with contrast control at minimum and all other controls in normal operating position with no signal input.
5. Tuner on Channel 13 or channel of least noise with antenna terminals shorted.
WAVEFORM MEASUREMENTS
1. Taken from point indicated to chassis with a wide-band oscilloscope.
2. Oscilloscope synced near sweep rate indicated.
3. Taken with strong signal; contrast control at maximum; all other controls in normal operating position.
CAPACITORS - Unless otherwise specified, values less than one in MF; all others in MMF.

MOTOROLA MODELS Y21K150B, M, W, Y21K151B, M, W, Y21K152CW, Y21K153B, M, W, Y21K154CW, Y21T73B, M, W,
21K150B, M, W, 21K151B, M, W, 21K152CW, 21K153B, M, W, 21K154CW, 21T73B, M, W (CH. TS-567, Y)

Schematic Diagram Courtesy of Motorola Inc.

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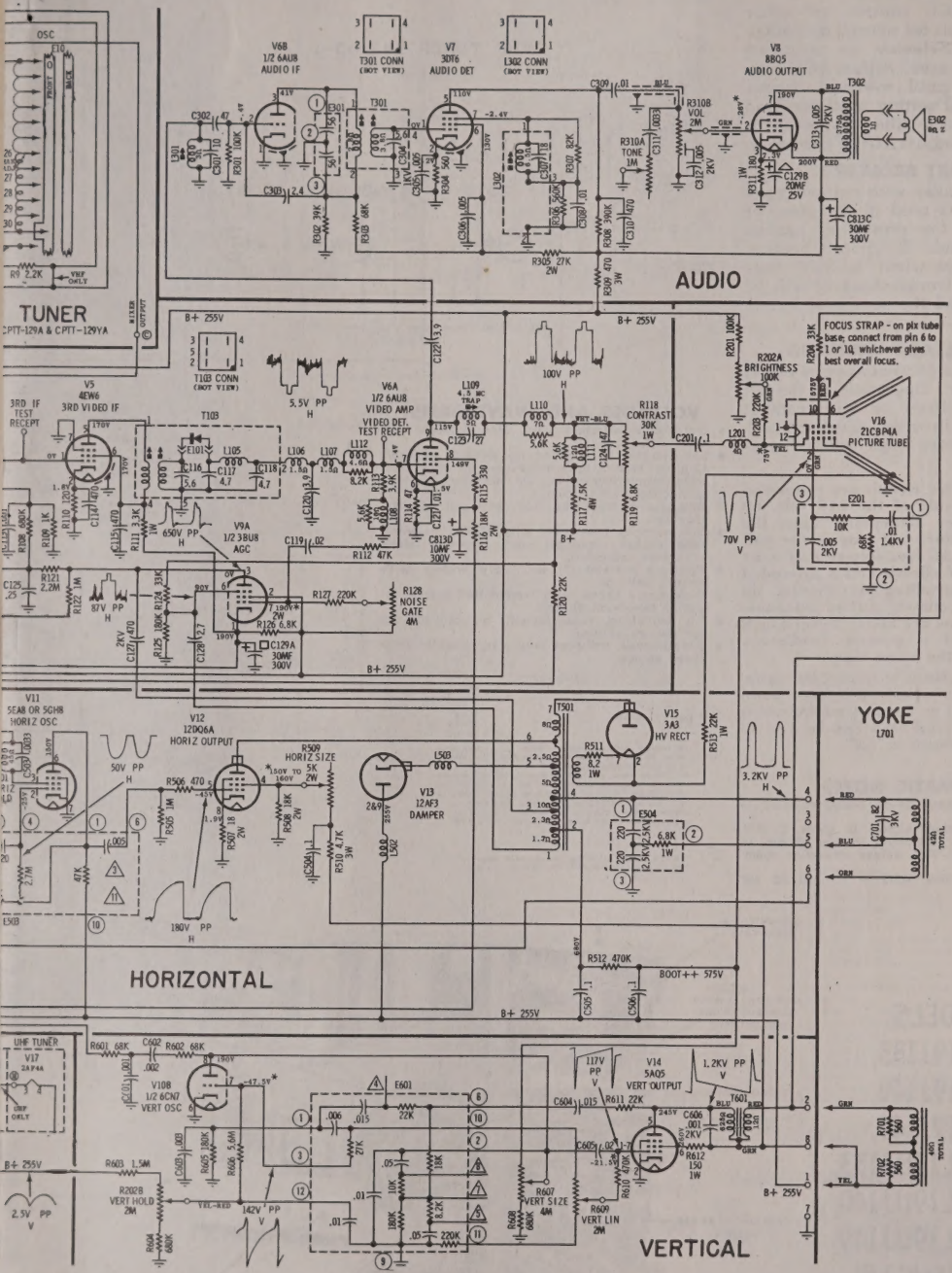
SET 495 FOLDER 20-S



M, W, Y21K154CW, Y21T73B, M, W,

21T73B, M, W (CH. TS-567, Y)

Schematic Diagram Courtesy of Motorola Inc.